

Report

Report no. 9/23

Hazard classification and labelling of petroleum substances in the European Economic Area - 2023

ISBN 978-2-87567-176-9



9 782875 671769

Hazard classification and labelling of petroleum substances in the European Economic Area - 2023

This report was prepared by: E. Di Caprio, C. Mertl, C. Kotsiki, L. Fievez-Fournier

Under the supervision of E. Di Caprio (Concawe Science Executive)

At the request of:

Concawe Special Task Force on Classification and Labelling (STF-23)

Thanks for contribution to:

A.Mannaerts

Reproduction permitted with due acknowledgement

© Concawe
Brussels
November 2023

ABSTRACT

This report updates Concawe's classification and labelling recommendations Report No. 1/22 to address latest updates to Concawe dossiers and changes to CLP regulation.

Furthermore this report introduces to new hazard introduced by Delegated Regulation (EU) 2023/707 and includes 2 new renewable UVCB hydrocarbon substances that were recently added in the Concawe portfolio as renewable fuels.

KEYWORDS

Hazard, health, environment, physical, flammability, petroleum and UVCB hydrocarbon substances, classification, packaging, labelling, REACH, GHS, CLP.

INTERNET

This report is available as an Adobe pdf file on the Concawe website (www.concawe.eu).

NOTE

Considerable efforts have been made to assure the accuracy and reliability of the information contained in this publication. However, neither Concawe nor any company participating in Concawe can accept liability for any loss, damage or injury whatsoever resulting from the use of this information.

This report does not necessarily represent the views of any company participating in Concawe.

Version	Major Changes	Date
9/23	<ul style="list-style-type: none"> Review of Concawe dossier content updates 2022 and 2023 Removal of Petroleum Gases and Other Petroleum Gases (worst-case C&L recommendations in sections 7.2 and 7.3 and permutations from Appendix 6) Removal of Petroleum Cokes (section 7.24 and Appendix 1 and 6) Changes in Concawe substance inventory (Appendix 1) Addition of 18th ATP to CLP (cumene Carc. 1B re-classification) in sections 2, 6, and addition of a footnote in sections 8.2 (Naphtha), 8.3 (Kerosine) and 8.4 (MK1) of the report. Addition of new C&L permutations in Appendix 6. Introduction to new hazard classes in CLP Regulation (Delegated Regulation (EU) 2023/707) in section 4. Addition of two (2) new renewable UVCB hydrocarbon substances (section 8, appendix 1, appendix 6) 	
1/22	<ul style="list-style-type: none"> Latest amendments of the CLP Regulation (EC) No 1272/2008 (EU, 2008) up to and including the 17th ATP and Corrigendum to Annex VI Addition of Petroleum Gases (7.2) and Other Petroleum Gases (7.3) to the report and Appendix 6 2021 changes in Concawe substance inventory (Appendix 1) Concawe's and LOA Consortium's dossier content updates 2021 	3.3.2022
10/20	<ul style="list-style-type: none"> Revision of Appendix 6 (C&L Permutations) Latest amendments of the CLP Regulation (EC) No 1272/2008 (EU, 2008) up to and including the 13th ATP List of petroleum substances in Appendix 1 updated according to active registrations in the Concawe substance portfolio. 	22.10. 2020
13/17	<ul style="list-style-type: none"> Updated text according to implementation of the 8th ATP to the CLP regulation. Addition of Petroleum Gases and Other Petroleum Gases categories (worst-case C&L recommendations). 	11.2017

Version	Major Changes	Date
	<ul style="list-style-type: none"> Revision of Appendix 6 (C&L Permutations). Alignment of human health information within categories justifying rationale for classification. 	
9/15	<ul style="list-style-type: none"> Updated C&L recommendations to address the repeal of the DSD (Directive 67/548/EC) and DPD (Directive 1999/45/EC) as repealed by EU Regulation on Classification, Labelling and Packaging ((EC) No 1272/2008, as amended) on 1st June 2015 	12.2015
10/14	<ul style="list-style-type: none"> Updated C&L recommendations to reflect the publication of the 4th Adaptations to Technical Progress (ATP) of the EU Regulation on Classification, Labelling and Packaging ((EC) No 1272/2008) that shall apply in respect of substances from 1 December 2014 and in respect of mixtures from 1 June 2015. 	09.2014
8/12	<ul style="list-style-type: none"> Updated C&L recommendations to reflect the publication of the 2nd and 3rd Adaptations to the EU Regulation on Classification, Labelling and Packaging ((EC) No 1272/2008). 	11.2012
11/10R (11/10)	<ul style="list-style-type: none"> Update Concawe classification and labelling recommendations from 2005, which were based on the data available at the time compared to criteria established in Annex VI of the Dangerous Substances Directive (DSD) (Directive 2001/59/EC). Assessments of additional and new data on hazard properties of petroleum substances and comparison with both the DSD and Classification, Labelling and Packaging (CLP) ((EC) No 1272/2008) criteria. 	05.2012 (12/2010)

The Concawe's C&L Report has a long history, with its first issue dating back in 1998, as recommended classification and labelling of petroleum substances according to the EU Dangerous Substances Directive (DSD).

Starting with 2010, with CLP Regulation enforced and DSD repealed, the Report continued to be updated regularly, as to timely reflect the regulatory transition and further implementation of subsequent ATPs to CLP Regulation.

This report also include 2 new fuels renewable UVCB Hydrocarbon substances that were recently added in Concawe portfolio as renewable fuels.

CONTENTS	PAGE
SUMMARY	IX
1. INTRODUCTION	1
2. SCOPE OF THIS REPORT	3
3. CLASSIFICATION APPROACH ACCORDING TO CLP	5
3.1. CLASSIFICATION OF SUBSTANCES	5
3.1.1. CLP Hazard / Precautionary Statements	7
3.2. HAZARD CLASSIFICATION CRITERIA	7
3.2.1. Physical Endpoints	8
3.2.2. Health Endpoints	9
3.2.2.1. Acute Toxicity	9
3.2.2.2. Irritation/Corrosion	9
3.2.2.3. Sensitisation	11
3.2.2.4. Germ Cell Mutagenicity	12
3.2.2.5. Carcinogenicity	13
3.2.2.6. Reproductive Toxicity	14
3.2.2.7. Specific Target Organ Toxicity	14
3.2.2.8. Aspiration hazard	16
3.2.3. Environmental Endpoints	17
3.2.3.1. Hazardous to the aquatic environment	17
4. NEW HAZARD CLASSES	19
5. SPECIAL CONSIDERATIONS FOR CONCAWE UVCB HYDROCARBON SUBSTANCES	23
5.1. GROUPING/CATEGORY APPROACH	23
5.2. CLASSIFICATION AND LABELLING OF UVCB HYDROCARBON SUBSTANCES - 'SPECIAL TESTING CONSIDERATIONS'	24
5.3. HARMONISED CLASSIFICATIONS	24
5.4. SELECTION OF PRECAUTIONARY STATEMENTS	24
5.5. REGULATORY AND OIL INDUSTRY NOTES	25
5.6. SUPPLY AND TRANSPORT LABELLING	26
5.6.1. Content of the label	26
5.6.2. Interaction with transport labelling	27
5.7. SAFETY DATA SHEET - IMPACT OF CLP	27
5.8. DOWNSTREAM LEGISLATIVE IMPACT OF CLP ON OPERATIONS	27
5.9. CLASSIFICATION AND LABELLING INVENTORY	28
5.9.1. Format for notification	29
5.9.2. Agreed entries	29
5.9.3. Timing - notification deadline	29
5.10. CLP UPDATING PROCESS	29
6. GLOSSARY	31
7. REFERENCES FOR BODY OF REPORT	32
8. CLASSIFICATION AND LABELLING RECOMMENDATIONS	36
8.1. CRUDE OILS (CRUDEOIL)	36

8.2.	LOW BOILING POINT NAPHTHAS (GASOLINES) (NAPHTHA)	43
8.3.	KEROSINES (Kerosine)	52
8.4.	MK1 DIESEL FUEL (MK1)	60
8.5.	STRAIGHT-RUN GAS OILS (SRGO)	67
8.6.	CRACKED GAS OILS (CRACKEDGO)	75
8.7.	VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS (VHGO)	82
8.8.	OTHER GAS OILS (OTHERGO)	88
8.9.	HEAVY FUEL OIL COMPONENTS (HFO)	94
8.10.	UNREFINED / ACID TREATED OILS (UATO)	99
8.11.	HIGHLY REFINED BASE OILS (HRBO)	105
8.12.	OTHER LUBRICANT BASE OILS (LBO)	111
8.13.	UNTREATED DISTILLATE AROMATIC EXTRACTS (UDAE)	117
8.14.	TREATED DISTILLATE AROMATIC EXTRACTS (TDAE)	122
8.15.	RESIDUAL AROMATIC EXTRACTS (RAE)	130
8.16.	SLACK WAXES (SLACKWAX)	136
8.17.	PARAFFIN AND HYDROCARBON WAXES (PARAFFINWAX)	142
8.18.	FOOTS OILS (FOOTSOIL)	147
8.19.	PETROLATUMS (PETROLATUM)	153
8.20.	BITUMENS (BITUMEN)	160
8.21.	ASPHALT (OXIASPH)	166
8.22.	SULFUR (SULFUR)	171
8.23.	RENEWABLE HYDROCARBONS (DEOXYGENATE DIESEL TYPE FRACTION - RENEWDD)	176
APPENDIX 1:	LISTING OF UVCB HYDROCARBON SUBSTANCES	184
APPENDIX 2:	REGULATORY AND OIL INDUSTRY NOTES	190
APPENDIX 3:	DOWNSTREAM LEGISLATION IMPACTED BY THE CLP REGULATION	192
APPENDIX 4:	APPLICATIONS FOR USING TEST DATA FOR THE UVCB SUBSTANCE	194
APPENDIX 5:	HAZARD CLASSIFICATION FOR DEVELOPMENTAL TOXICITY ACCORDING TO CLP	196
APPENDIX 6:	C&L PERMUTATIONS	198
	CRUDE OILS (CRUDEOIL)	199
	LOW BOILING POINT NAPHTHAS (GASOLINES) (NAPHTHA)	215
	KEROSINES (Kerosine)	300
	MK1 DIESEL FUEL (MK1)	308
	STRAIGHT-RUN GAS OILS (SRGO)	312
	CRACKED GAS OILS (CRACKEDGO)	319
	VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS (VHGO)	324
	OTHER GAS OILS (OTHERGO)	332
	HEAVY FUEL OIL COMPONENTS (HFO)	340
	UNREFINED / ACID TREATED OILS (UATO)	344
	HIGHLY REFINED BASE OILS (HRBO)	348
	OTHER LUBRICANT BASE OILS (LBO)	349
	UNTREATED DISTILLATE AROMATIC EXTRACTS (UDAE)	355
	TREATED DISTILLATE AROMATIC EXTRACTS (TDAE)	359
	RESIDUAL AROMATIC EXTRACTS (RAE)	364
	SLACK WAXES (SLACKWAX)	366
	PARAFFIN AND HYDROCARBON WAXES (PARAFFINWAX)	368

	FOOTS OILS (FOOTSOIL)	369
	PETROLATUMS (PETROLATUM)	374
	BITUMENS (BITUMEN)	376
	OXIDIZED ASPHALT (OXIASPH)	377
	SULFUR (SULFUR)	378
	RENEWABLE DEOXYGENATE DIESEL (RENEWDD)	379
APPENDIX 7:	HISTORICAL CONTENT OUTLINING THE CHANGES FROM PREVIOUS LEGISLATION TO THE CLP REGULATION	383

SUMMARY

The Concawe recommendations on classification and labelling (C&L) were last updated in January 2022 (Concawe, 2022a).

This report updates the dossier changes made in 2022-2023 impacting C&L recommendations of UVCB hydrocarbon substances as follows:

- revised justification for acute inhalation toxicity for Naphtha category substances (Section 8.2);
- rationalisation of Concawe substance inventory, with 13 more substances placed as 'inactive' (**Appendix 1**);
- No removal of CLP permutations (Appendix 6);
- addition of 17 C&L permutations due to cumene for Naphthas, Kerosines and MK1 and RenewDD in Appendix 6.
- Introduction of new hazard classes for the Delegated Regulation (EU) 2023/707 (EU, 2023);
- Widen the scope to new renewable fuels hydrocarbon substances.

The revised uses, exposure scenarios, chemical safety reports and PBT statements of the 2022 registration dossiers did not impact on the content of this report.

In addition,

- the worst case C&L recommendations for Petroleum Gases and Other Petroleum Gases from sections 7.2 and 7.3 of the report have been removed, as well as their permutations in **Appendix 6**;
- the recommendation for White Spirit naphtha EC 265-185-4 was reviewed (**Appendix 6**);
- references to the already published Delegated act, introducing new hazard classes as part of the CLP revision process, are included in section 3;
- references to the impact of the 18th ATP to CLP upgrading the harmonised classification of cumene to Carcinogenic Category 1B were added to sections 2, 6 and 7 of this report.

Classification and labelling recommendations are included in specific chapters of this report.

1. INTRODUCTION

The EU regulation on classification, labelling and packaging of substances and mixtures, known as the ‘CLP’ Regulation (EC) No 1272/2008 entered into force on 20 January 2009 (EU, 2008). This Regulation has subsequently been subject to several legislative Adaptations to Technical Progress (ATPs) and Corrigendum to Annex VI of CLP¹. CLP applies the terminology, evaluation principles and criteria of the United Nations Globally Harmonized System (GHS) of Classification, Labelling and Packaging of Chemicals (UN, 2021). The stated purpose of CLP is to ensure a high level of protection of human health and the environment as well as the free movement of substances, mixtures and articles.

UN GHS is intended to provide a common basis globally, to define and classify chemicals according to their hazards and to communicate this information via labels and safety data sheets. As such, target audiences include consumers, workers and emergency responders.

In 1992, the United Nations Conference on the Environment and Development (UNCED) established a programme to strengthen national and international efforts related to the environmentally sound management of chemicals. Due to the disparity of existing regional systems, the need for a globally harmonised hazard classification and labelling system for chemicals was identified. The World Summit on Sustainable Development held in 2002, encouraged implementation of the GHS as soon as possible, with a view to having the system fully operational by 2008. Work to update ‘Globally Harmonized System’ continues with publication of the ninth revised edition of the UN GHS document, known as the ‘purple book’, in 2021 (UN, 2021). The 12th ATP of CLP implements the 6th and 7th version of the GHS in the EU.

Although the UN GHS provides a common basis for hazard classification and communication for transport and supply and use, it also includes a “building block” approach. Since it is recognised that UN GHS will not be completely “harmonised” at first, these building blocks will facilitate implementation by individual countries or regions. The UN states that *“...countries are free to determine which of the building blocks will be applied in different parts of their systems . . . While the full range is available to everyone . . . the full range does not have to be adopted”*. It is intended that the UN GHS document will be updated every two years to reflect the technical changes needed. CLP applies the building block approach in seeking to align EU legislation as far as possible with the UN GHS, whilst maintaining some elements from previous Community legislation, that are not currently addressed in UN GHS. Also, the EU has already started work on the process to the inclusion of the new hazard classes, already adopted at EU level (EU, 2023), in UN GHS.

Manufacturers and importers (or groups of manufacturers and importers) who place hazardous substances on the market, will also have to notify ECHA of certain information within one month of placing on the market, in particular the substance identity and the classification and labelling of each hazardous substance, unless this information has already been submitted as part of a registration dossier under REACH (EU, 2006). ECHA will then include the notified information in the C&L Inventory.

Guidance on the application of CLP in the context of REACH has been developed by ECHA (ECHA, 2017; ECHA, 2019) and is currently on revision due to the introduction of new hazard classes

¹ EU, 2009; EU, 2011; EU, 2012a; EU, 2013a; EU, 2013b; EU, 2013c; EU, 2014; EU, 2015; EU, 2016a; EU, 2016b; EU, 2017; EU, 2018 a; EU, 2018b; EU, 2019; EU, 2020a; EU, 2020b; EU, 2021a; EU, 2021b; EU, 2022; EU, 2023

The purpose of this report is to provide guidance on the classification and labelling of substances produced by the EU refineries and placed on the market, according to the requirements of CLP.

The provisions of CLP also apply to classification, labelling and packaging of mixtures that are placed on the market. Detailed guidance regarding mixtures is not however within the scope of this report as duly described and maintained in the CLP Regulation itself.

2. SCOPE OF THIS REPORT

This report contains an assessment of the hazardous properties of UVCB hydrocarbon substances based on their REACH registration dossiers or C&L notification (art. 40 CLP) with the criteria of the CLP Regulation ((EC) No 1272/2008) up to and including the 18th ATP (EU, 2022) to CLP. The 18th ATP upgrades the harmonised classification of cumene as Carcinogenic 1B, by December 1st, 2023. The impact on the Concawe naphtha, kerosine and MK-1 dossiers is currently being assessed, and the Concawe classification recommendations are published in the current version of the report as the revised dossiers have been released.

A recent Delegated Regulation (EU) 2023/707 amending CLP Regulation is adopted as to set out new hazard classes and criteria for the classification, labelling and packaging of substances and mixtures (EU, 2023). This EU legislation is binding to manufacturers, importers, downstream users and distributors placing substances on the European Union market and are to also be referred to harmonised classification and labelling.

This report has been developed as industry guidance for the classification, labelling and packaging of UVCB hydrocarbon substances under CLP, which introduces the GHS into the European legislative framework.

This report outlines the objectives and principles of CLP and the classification and labelling requirements that it introduces; its entry and phased implementation into EU legislation; specific issues that apply to UVCB hydrocarbon substances; and Concawe recommendations for classification, labelling, and packaging of UVCB hydrocarbon substances.

The classification recommendations have been updated from the previous Concawe guidance to reflect new information in their registration dossiers, changes in classification criteria and to accommodate REACH categories of UVCB hydrocarbon substances (EU, 2006).

These recommendations apply to UVCB hydrocarbon substances produced in the refinery but **do not** cover formulated UVCB hydrocarbon substances products placed on the market which are considered mixtures. An updated Concawe guidance on safety data sheets (Concawe, 2022b) is published on the Concawe website (<https://www.concawe.eu/publications/concawe-reports/>).

Substances of similar chemical composition and/or similar hazard profiles can be collected together in categories. With the exception of sulphur, most of oil refining industry substances are Substances of Unknown or Variable composition, Complex reaction products or Biological materials (UVCB). A category approach allows data on individual category members to be applied to other members of the category for which complete data may not be available or are impractical to obtain.

It is important to note that for each category, the most severe hazard classification and labelling recommendation is presented as the default recommendation in the body of the report. However, based on the application of regulatory or oil industry notes, concentration limits and physical-chemical properties (e.g., flashpoint, viscosity), several classification and labelling permutations may be possible within a category. In those cases where EU harmonised classifications for certain endpoints exist, the EU harmonised classifications are supplemented with self-classifications for all other endpoints (see section 4.4) as required by the CLP regulation.

The following categories and stand-alone substances are covered in this report. Full names and the acronyms ('short names') used in the REACH registration dossiers are provided.

Full name	Short name
Crude oils (stand-alone)	Crudeoil
Low Boiling Point Naphthas (Gasolines)	Naphtha
Kerosines	Kerosine
MK1 Diesel Fuel (stand-alone)	MK1
Straight-run Gas Oils	SRGO
Cracked Gas Oils	CrackedGO
Vacuum Gas Oils, Hydrocracked Gas Oils & Distillate Fuels	VHGO
Other Gas Oils	OtherGO
Heavy Fuel Oil Components	HFO
Unrefined / Acid Treated Oils	UATO
Highly Refined Base Oils	HRBO
Other Lubricant Base Oils	LBO
Untreated Distillate Aromatic Extracts	UDAE
Treated Distillate Aromatic Extracts	TDAE
Residual Aromatic Extracts	RAE
Slack Waxes	Slackwax
Paraffin and Hydrocarbon Waxes	Paraffinwax
Foots Oils	Footsoil
Petrolatums	Petrolatum
Bitumens	Bitumen
Oxidized Asphalt (stand-alone)	OxiAsph
Sulfur (stand-alone)	Sulfur
Renewable hydrocarbon (deoxygenate diesel type fraction)	RenewDD

The following categories are not covered herein: lubricant greases; used oils; re-refined oils; reclaim petroleum substances, other petroleum substances, synthetic hydrocarbons and hydrocarbon solvents². Manufacturers of these substances need to classify their materials according to legislative requirements.

Changes since last report 1/22 (Concawe, 2022a): **Appendix 6** (C&L Permutations) is revised in alignment with current version of registration dossiers; all C&L permutations for Petroleum Gases and Other Petroleum Gases categories are removed and currently valid permutations are available from the LOA Consortium (LOA, 2022). List of UVCB hydrocarbon substances in **Appendix 1** has been updated according to active registrations in the Concawe substance portfolio. Regulatory notes in Annex VI of the CLP Regulation are updated by the European Commission (16th ATP to CLP; EU, 2021a). List of notes in **Appendix 2** of the C&L report are updated accordingly.

² This report addresses the classification and labelling of groups of UVCB substances which are the primary products of petroleum refining. It should be recognized that some of these groups contain UVCB substances which may also be identified as hydrocarbon solvents. Hydrocarbon solvents are derived, among others, from refinery streams by further refining e.g. redistillation, hydrogenation, and extraction. As a result, the composition of hydrocarbon solvents may differ significantly from refinery streams. The classification and labelling of hydrocarbon solvents are not considered further in this report.

3. CLASSIFICATION APPROACH ACCORDING TO CLP

3.1. CLASSIFICATION OF SUBSTANCES

CLP distinguishes three hazard types (physical, health and environmental hazards), with their respective “classes” (endpoints). In most cases, hazard classes are further subdivided into hazard categories (EU, 2008).

Not all GHS endpoints have been adopted by CLP in line with the ‘Building Block’ approach. Below in the table, there are indicated differences in hazard class/categories between GHS and CLP regulation.

GHS v.9 (2021) Hazard Category	CLP Hazard Category (GHS v.7, as up to 17 th ATP)
Flammable gases and chemically unstable gases:	Flammable gases and chemically unstable gases:
Flammable Gas 1A Pyrophoric Gas Chemically Unstable Gas A Chemically Unstable Gas B	Flammable Gas 1A Pyrophoric Gas Chemically Unstable Gas A Chemically Unstable Gas B
Flammable Gas 1B	Flammable Gas 1B
Flammable Gas 2	Flammable Gas 2
Gases under pressure:	Gases under pressure:
Compressed Gas	Compressed Gas
Liquefied Gas	Liquefied Gas
Refrigerated Liquefied Gas	Refrigerated Liquefied Gas
Dissolved Gas	Dissolved Gas
Flammable liquids:	Flammable liquids:
Flam. Liq. 1	Flam. Liq. 1
Flam. Liq. 2	Flam. Liq. 2
Flam. Liq. 3	Flam. Liq. 3
Flam. Liq. 4	
Acute toxicity (oral):	Acute toxicity (oral):
Acute Tox 1	Acute Tox 1
Acute Tox 2	Acute Tox 2
Acute Tox 3	Acute Tox 3
Acute Tox 4	Acute Tox 4
Acute Tox 5	
Acute toxicity (dermal):	Acute toxicity (dermal):
Acute Tox 1	Acute Tox 1
Acute Tox 2	Acute Tox 2
Acute Tox 3	Acute Tox 3
Acute Tox 4	Acute Tox 4
Acute Tox 5	
Acute toxicity (gases/vapours/dusts and mists - inhalation):	Acute toxicity (gases/vapours/dusts and mists - inhalation):
Acute Tox 1	Acute Tox 1
Acute Tox 2	Acute Tox 2
Acute Tox 3	Acute Tox 3
Acute Tox 4	Acute Tox 4
Acute Tox 5	

GHS v.9 (2021) Hazard Category	CLP Hazard Category (GHS v.7, as up to 17 th ATP)
Skin corrosion/irritation:	Skin corrosion/irritation:
Skin Corrosion 1	Skin Corrosion 1
Skin Corrosion 1A	Skin Corrosion 1A
Skin Corrosion 1B	Skin Corrosion 1B
Skin Corrosion 1C	Skin Corrosion 1C
Skin Irritation 2	Skin Irritation 2
Mild Skin Irritation 3	
Serious eye damage/eye irritation:	Serious eye damage/eye irritation:
Serious Eye Damage 1	Serious Eye Damage 1
Eye Irritation 2	Eye Irritation 2
Eye Irritation 2A	
Eye Irritation 2B	
Respiratory sensitisation:	Respiratory sensitisation:
Resp. Sens. 1	Resp. Sens. 1
Resp. Sens. 1A	Resp. Sens. 1A
Resp. Sens. 1B	Resp. Sens. 1B
Skin sensitisation:	Skin sensitisation:
Skin Sens. 1	Skin Sens. 1
Skin Sens. 1A	Skin Sens. 1A
Skin Sens. 1B	Skin Sens. 1B
Germ cell mutagenicity:	Germ cell mutagenicity:
Muta. 1	Muta. 1
Muta. 1A	Muta. 1A
Muta. 1B	Muta. 1B
Muta. 2	Muta. 2
Carcinogenicity:	Carcinogenicity:
Carc. 1	Carc. 1
Carc. 1A	Carc. 1A
Carc. 1B	Carc. 1B
Carc. 2	Carc. 2
Reproductive toxicity:	Reproductive toxicity:
Repr. 1	Repr. 1
Repr. 1A	Repr. 1A
Repr. 1B	Repr. 1B
Repr. 2	Repr. 2
Lactation	Lactation
Specific target organ toxicity - Single Exposure:	Specific target organ toxicity - Single Exposure:
STOT SE 1	STOT SE 1
STOT SE 2	STOT SE 2
STOT SE 3	STOT SE 3
Specific target organ toxicity - Repeated Exposure:	Specific target organ toxicity - Repeated Exposure:
STOT RE 1	STOT RE 1
STOT RE 2	STOT RE 2
Aspiration toxicity:	Aspiration toxicity:
Asp. Tox. 1	Asp. Tox. 1
Asp. Tox. 2	
Hazardous to the aquatic environment, short-term (Acute):	Hazardous to the aquatic environment, short-term (Acute):
Aquatic Acute 1	Aquatic Acute 1
Aquatic Acute 2	

GHS v.9 (2021) Hazard Category	CLP Hazard Category (GHS v.7, as up to 17 th ATP)
Aquatic Acute 3	
Hazardous to the aquatic environment, long-term (Chronic):	Hazardous to the aquatic environment, long-term (Chronic):
Aquatic Chronic 1	Aquatic Chronic 1
Aquatic Chronic 2	Aquatic Chronic 2
Aquatic Chronic 3	Aquatic Chronic 3
Aquatic Chronic 4	Aquatic Chronic 4

Furthermore, not all CLP hazard classes can be found in GHS. They originate in some R-phrases under former DSD and are included as supplemental hazard statements (EUH) in Part 1 of Annex II to CLP.

Additionally, the newly introduced hazard classes in the CLP revision process (EU, 2023) also currently not in GHS are represented by new EUH statements included in Part 1 of Annex II to CLP, with effect from April 20th 2023.

3.1.1. CLP Hazard / Precautionary Statements

The CLP regulation uses hazard statements (H-statements). For example, eye irritation category 2 H319 ‘causes serious eye irritation’. CLP Annex III lists the correct wording of the hazard statements, as these should appear on the label.

Furthermore, labelling advice to prevent or minimise adverse effects to human health or environment is communicated under CLP through the use of precautionary statements (P-statements). CLP Annex IV Part II, as amended, lists the correct wording of the precautionary statements, as they should appear on the label.

Classification of a substance for a specific hazard “class” and “category” is thus accompanied by specific H- and P-statements. These are specified at the end of every section dealing with classification criteria.

These statements are assigned a unique alphanumerical code, which consists of one letter (H = Hazard, P = Precautionary) and three digits, as follows:

- One digit to designate the class (type) of hazard, e.g. ‘2’ for physical hazard
- Two further digits corresponding to the sequential numbering of statements as follows:

Hazard (H)
200 - 299 : Physical Hazard
300 - 399 : Health Hazard
400 - 499 : Environmental Hazard

Precautionary (P)
100 - 199 : General
200 - 299 : Prevention
300 - 399 : Response
400 - 499 : Storage
500 - 599 : Disposal

Several of these P-statements are incomplete and require completion by the classifying entity. For example: P264 reads “Wash ... thoroughly after handling” meaning that the words “hands” and/or “affected skin areas” should be inserted to replace “...”.

3.2. HAZARD CLASSIFICATION CRITERIA

Classification is based on comparison of test data against criteria for each of the hazard classes/categories. The criteria for classification are found in CLP Annex I.

3.2.1. Physical Endpoints

Data are used to assess the physical hazards (e.g. flammability) and help predict possible toxicological or environmental hazards, fate and behaviour. They are used for the purposes of safe handling and to help in the identification of risks posed to humans and the environment from all stages of a substance life cycle.

For UVCB hydrocarbon substances, some physical endpoints as required under CLP are not applicable or relevant; alternative endpoints should be used (e.g. Initial Boiling Point instead of Boiling point range).

Due to their inherent properties and chemical structure considerations, the following hazard categories do not apply or are considered irrelevant for UVCB hydrocarbon substances:

- Explosive
- Oxidising (gas, liquid, solid)
- Pyrophoric (gas, solid, liquid)
- Self-reactive and Self-heating
- Organic Peroxide
- Corrosive to Metal
- Substance which in contact with water emits flammable gas

As amended by the 12th ATP to CLP (EU, 2019), to classify petroleum gases for flammability it is necessary to evaluate their flammable range with air at 20°C and a standard pressure of 101,3 kPa.

Classification criteria	Cat. 1A	Cat. 1B	Cat. 2
Flammable gases	(a) ignitable when in a mixture of $\leq 13\%$ v/v in air; or (b) flammable range with air of $> 12\%$ points regardless of the LFL, unless data show the criteria for Cat. 1B are met.	flammability criteria for Cat. 1A met and at least either: (a) LFL $> 6\%$ v/v in air; or (b) fundamental burning velocity < 10 cm/s.	other than those of Cat. 1A or 1B, with a flammable range while mixed in air.

LFL= Lower Flammability Limit

When packaged under pressure, petroleum gases have to be classified, according to their physical state, in one of four groups:

Group	Criteria - when packaged under pressure, the gas is
Compressed gas	Entirely gaseous at -50°C , including all gases with a critical temperature $\leq -50^{\circ}\text{C}$.
Liquefied gas	Partially liquid at temperatures $> -50^{\circ}\text{C}$, split as: <ul style="list-style-type: none"> • high pressure liquefied gas: critical temperature between -50°C and $+65^{\circ}\text{C}$; and • low pressure liquefied gas: critical temperature $> +65^{\circ}\text{C}$.
Refrigerated liquefied gas	Partially liquid because of its low temperature
Dissolved gas	Dissolved in a liquid phase solvent

In classifying liquid UVCB hydrocarbon substances for flammability it is necessary to evaluate information on flash point and initial boiling point.

Classification criteria	Cat. 1	Cat. 2	Cat. 3
Flash point °C	< 23	< 23	≥ 23 and ≤ 60
Initial boiling point °C	≤ 35	> 35	

It should be recognised that under CLP, gas oils, diesel, and light heating oils having a flash point between ≥ 55 °C and ≤ 75 °C may be regarded as flammable liquid Category 3.

3.2.2. Health Endpoints

3.2.2.1. Acute Toxicity

Under CLP, acute toxicity hazard is differentiated into oral, dermal and inhalation routes of exposure CLP uses acute lethality e.g. LD₅₀ (oral, dermal) or LC₅₀ (inhalation) values, to assess acute toxicity. CLP divides acute toxicity into 4 categories: Category 1 to 4. For the inhalation route, there are three different types of exposure: gases, vapours and dusts/mists which have different cut-off values in CLP.

Acute toxicity cut-off values in CLP are shown in the following table.

Exposure route	Cat. 1	Cat. 2	Cat. 3	Cat. 4
Oral (LD ₅₀ mg/kg _{bw})	≤ 5	> 5 - ≤ 50	> 50 - ≤ 300	> 300 - ≤ 2000
Dermal (LD ₅₀ mg/kg _{bw})	≤ 50	> 50 - ≤ 200	> 200 - ≤ 1000	> 1000 - ≤ 2000
Gases (LC ₅₀ ppmV) ³	≤ 100	> 100 - ≤ 500	> 500 - ≤ 2500	> 2500 - ≤ 20000
Vapours (LC ₅₀ mg/l) ⁴	≤ 0.5	> 0.5 - ≤ 2	> 2 - ≤ 10	> 10 - ≤ 20
Dusts and mists (LC ₅₀ mg/l) ⁵	≤ 0.05	> 0.05 - ≤ 0.5	> 0.5 - ≤ 1	> 1 - ≤ 5

3.2.2.2. Irritation/Corrosion

Skin

CLP distinguishes between corrosion and irritation of the skin. The legislative text regards corrosion as the irreversible destruction of skin tissue within an exposure period of up to 4 hours, and irritation as a reversible effect after 4 hours exposure.

CLP emphasises the use of a tiered approach for classification and labelling under this endpoint. Use of existing human, animal and validated *in vitro* data can be used to perform a weight-of-evidence decision for hazard classification.

In the absence of existing data, for corrosion in particular, the use of extreme pH values as a surrogate to predict corrosion for the purpose of classification is also outlined (pH

³ For gases the measurement units are ppmV. It must be noted that CLP specifies that for a vapour which is near the gaseous phase, classification shall be based on ppmV.

⁴ Vapours are defined as: the gaseous form of a substance or mixture released from its liquid or solid state.

⁵ Dusts (suspended solid particles, from mechanical processes) and mist (suspended liquid droplets, from condensation of supersaturated vapours or physical shearing of liquids) are defined as generally having particle sizes in a range from >1 to ca. 100 µm.

range, strong acid or alkali reactions at $\text{pH} \leq 2$ or ≥ 11.5 respectively). Buffering effects should be taken into account, and if data suggest the substance is unlikely to be corrosive despite the low or high pH value, then further testing (preferably by validated *in vitro* test) should be carried out prior to assigning a classification.

The cut-off values for classification are based on the criteria set in the CLP. They are a combination of the exposure period, the persistence of the effect during the observation period, as well as mean values of erythema/eschar and oedema scores.

The 8th ATP to the CLP has included an additional category for Skin Corrosion. Where data are available, sub-categorisation will be applied as shown in the table below. Where data are not available, it is possible to select Category 1. For example in cases when it is evident that corrosive effects will occur (e.g. extreme pH) or have occurred but there is no information available on exposure time or the observation period.

Corrosion

Category	Exposure time: t	Observation period
Cat. 1	Corrosive effects observed, no information on exposure time or length of observation period	
Cat. 1A	$t \leq 3 \text{ min}$	$\leq 1 \text{ hour}$
Cat. 1B	$3 \text{ min} < t \leq 1 \text{ hour}$	$\leq 14 \text{ days}$
Cat. 1C	$1 \text{ hour} < t \leq 4 \text{ hours}$	$\leq 14 \text{ days}$

Other effects such as hyperplasia, hyperkeratosis, scaling, fissures, scab formation and alopecia are also taken into account in the overall evaluation of skin effects at the end of the observation period.

Skin irritation for reversible effects is assessed after a semi-occluded exposure of up to 4 hours. After exposure, erythema and/or oedema are assessed according to scores after 24, 48, and 72 hours.

Skin irritation studies of some UVCB hydrocarbon substances (e.g. distillate aromatic extracts and straight-run gas oils) have been performed under non-guideline conditions, such as exposure for up to 24 hours, under occluded conditions. The mean scores for erythema and oedema need to be assessed against the deviations in methodology. Following that, expert judgement should be used to decide whether irritation, sufficient for classification purposes would be expected, if the test had been conducted under guideline conditions. Data from repeat exposure tests can also be considered as part of a weight of evidence approach, and may be used as the basis for classification in the absence of other more definitive data.

Under CLP the major criteria for the irritant category are:

- At least 2 of 3 tested animals have a mean score of $\geq 2.3 - \leq 4.0$.
- Reversibility of skin lesions is another consideration in evaluating irritant responses. When inflammation persists to the end of the observation period in 2 or more test animals, taking into consideration alopecia (limited area), hyperkeratosis, hyperplasia and scaling, then a material shall be considered irritant.

Irritation

	Erythema or oedema mean value	Reading times
Cat. 2	$\geq 2.3 - \leq 4.0$	24, 48, 72 hours and: a) delayed reactions on 3 consecutive days b) persisting inflammation for 14 days in at least 2 animals particularly taking into account alopecia (limited area), hyperkeratosis, hyperplasia, and scaling reactions

Eye

CLP criteria are based on the severity of the effect in the eye, namely whether they are reversible or irreversible within 21 days of application.

According to the OECD test guideline 405 Category 1 (serious eye damage) covers substances having potential to seriously damage the eyes. Category 2 (eye irritation) covers substances that have the potential to induce reversible eye irritation.

Classification is based on the severity of effects on either the cornea and/or iris, and/or the severity of conjunctival redness and/or oedema, which is assessed by calculating the respective mean scores at each of the reading times (24, 48, 72 hours) for that effect and taking into account the number of animals in which an effect was observed. Please refer to the legislative text for the specific criteria.

Effect	Irreversible	Reversible
	Cat. 1	Cat. 2
Cornea opacity	≥ 3.0	≥ 1.0
Iris lesion	> 1.5	≥ 1.0
Conjunctival redness	-	≥ 2.0
Oedema (chemosis)	-	≥ 2.0

- For classification purposes CLP allows the use of human experience to assess the degree of the effects.
- Validated *in vitro* data should be used to make classification and labelling decision instead of conducting new animal tests (where available).
- Materials corrosive to skin are classified as causing irreversible ocular damage, hence extreme pH values are important considerations in this respect.

3.2.2.3. Sensitisation

Through implementation of the 2nd ATP, CLP introduces the concept of potency using two new subcategories (1A - strong sensitisers, 1B - moderate sensitisers) for both respiratory and skin sensitisation using primarily animal data. Potency is the concentration at which a substance induces sensitisation and is described by dose-response relationships at either the induction or the elicitation phase (EU, 2011).

Respiratory sensitisation

Under CLP evidence that a substance can induce specific respiratory hypersensitivity will normally be based on human experience. Although there is no validated OECD animal test

for this endpoint, CLP accepts animal data with measurements on specific markers as evidence of potential hazard.

Skin sensitisation

Animal studies for identification of skin sensitisation hazard, in contrast to respiratory sensitisation have been validated and are commonly used.

When assessing potency, cut-off values are applied to animal test results (mainly guinea pig tests or local lymph node assay). However, this sub-categorisation can only be applied where sufficient data exist to make the distinction; where the data are insufficient, the classification in Category 1 should be maintained.

CLP allows the use of human data for classification purposes. It must be pointed out that according to Article 7(3) of CLP; tests on humans shall not be performed for the purposes of classification. However, data obtained from other sources, such as clinical studies, can be used.

In the case of conflicting results with human and animal data, CLP has explicit text dealing with this issue. In brief, positive evidence from animal studies is regarded as more reliable than evidence from human studies. Evaluation of human data must be carried out with caution, since negative human data cannot normally be used to negate positive results from animal studies.

Following the criteria used in CLP, the respective classifications for respiratory and skin sensitisation are summarised in the following table:

Respiratory sensitisation	Category 1	Sub-category 1A
		Sub-category 1B
Skin sensitisation	Category 1	Sub-category 1A
		Sub-category 1B

3.2.2.4. Germ Cell Mutagenicity

Under CLP this hazard class is primarily concerned with substances that may cause mutations in the germ cells of humans that can be transmitted to the progeny.

The categories for classification are shown in the following table.

Cat. 1		Cat. 2
Cat. 1A	Cat. 1B	

Evaluation of the test results for UVCB hydrocarbon substances requires expert judgement taking into account all the available data in arriving at a classification.

The “Modified Ames Test” (Blackburn G.R. *et al*, 1986) is often used to assess the *in vitro* mutagenic activity of petroleum substances. The test was developed to maximise detection sensitivity of mutagenic activity in petroleum substances that is mediated by polycyclic aromatic compounds. Results are expressed as a Mutagenicity Index (MI), which represents the slope of the mutagenic dose response relationship. A positive result in this test indicates *in vitro* gene mutation.

Data from Mouse Lymphoma Assays (MLA) need to be evaluated with caution. Mouse lymphoma assays (MLAs) have historically exhibited a lack of performance and acceptability standards, hence the validity of MLA data has been questioned, and the

possibility that the positive results in these studies are not actually evidence of *in vitro* mutagenic activity must be considered.

Some UVCB hydrocarbon substances are classified and labelled as carcinogenic and it is generally accepted that carcinogenic activity is sometimes mediated via a genotoxic mechanism. Classification as a genotoxic carcinogen does not however automatically prompt additional classification as a germ cell mutagen since the criteria for germ cell mutagen classification require evidence of heritable damage, i.e. evidence that the substance is a somatic mutagen and the substance or a relevant metabolite can reach the germ line cells in the reproductive organs. Most petroleum carcinogenesis studies assess skin tumour induction, so any potential *in vivo* mutagenic activity is limited to the site of application and does not explicitly imply systemic effects. The mere presence of Polycyclic Aromatic Compounds (PAC) in petroleum streams are not necessarily an indication of hazard, because the complex nature of the substance may inhibit or enhance mutagenic activity. Thus, individual levels of PAC are not regarded as adequate surrogates for hazard evaluation.

As a consequence, unless there is clear evidence that germ cells are affected in germ cell assays, UVCB hydrocarbon substances which have been classified as carcinogenic are not also classified as germ cell mutagens.

3.2.2.5. Carcinogenicity

Under CLP this hazard concerns whether a substance has the potential to induce cancer or increase its incidence. Substances that have induced benign and malignant tumours in well-performed experimental studies on animals are considered to be presumed or suspected human carcinogens unless there is strong evidence that the mechanism of tumour formation is not relevant for humans.

The categories for classification are shown in the following table.

Cat. 1		Cat. 2
Cat. 1A	Cat. 1B	

Carcinogenicity classification for UVCB hydrocarbon substances may also be dependent on data from other predictive tests. The IP346 assay (IP, 1993) is a measure of the dimethyl sulfoxide (DMSO) extractables, results which have an established relationship with the outcome in in carcinogenicity mouse skin painting studies for certain categories of UVCB hydrocarbon substances. When the weight percent of extractables is less than three percent of the total weight of the extracted material, then the substance is not classified. When the weight percent is three or greater, then the substance becomes classified as a carcinogen. The IP346 assay is used as a predictive test for classification for Other Lubricant Base Oils, Foots Oils, Slack Wax, Petrolatum and Treated Aromatic Extracts Concawe categories. It is important to note that IP346 is not a method intended to measure PAC levels, but rather an indirect assessment of refinement to manufacture non-carcinogenic products.

Another predictive test that is used for carcinogenic classification is the modified Ames test. Described above in the germ cell mutagenicity section, this test is a measure of the *in vitro* genotoxic potential. In order to assess the carcinogenic potential of Residual Aromatic Extracts, the results of the assay, namely the MI value, have been correlated with mouse skin painting data, and a classification cut-point has been established. If the MI is less than 0.4, no classification is required.

These predictive tests and their impact on classification have been captured in EU Regulatory Notes and/or Oil Industry Notes for the appropriate categories (**Appendix 2**).

3.2.2.6. Reproductive Toxicity

Reproductive and developmental toxicity

Under CLP reproductive toxicity includes adverse effects on sexual function and fertility (adult males and females), as well as developmental toxicity in the offspring. The induction of genetically based heritable effects in the offspring is addressed under Germ Cell Mutagenicity and is not part of the scope of the reproductive toxicity endpoint.

The developmental effects of substances must be evaluated carefully to eliminate the possible confounding effects of maternal toxicity on the developing foetus. Generic guidance on this is given in **Appendix 5**.

Under CLP reproductive toxicity is subdivided under two main headings:

- Adverse effects on sexual function and fertility.
- Adverse effects on development of the offspring.

The categories for classification are shown in the following table.

Cat. 1		Cat. 2	Effects on or via lactation
Cat. 1A	Cat. 1B		

In cases where there are no clear data to the contrary, the hazard statement specifying both 'damage to fertility' AND 'damage to the unborn child' should be assigned. It is possible to omit the specific hazard statement for fertility or developmental effects, in cases where there are clearly negative results.

Effects during lactation

Under CLP, adverse effects on or via lactation are included under reproductive toxicity, but for classification purposes such effects are treated separately. This is because it is desirable to be able to classify substances specifically for an adverse effect on lactation ("Effects on or via lactation, H362") so that a specific hazard warning about this effect can be provided for lactating mothers independently of whether the substance is classified for reproductive toxicity.

Accordingly, in CLP, the assignment of H362 ("May cause harm to breast-fed children") is independent of consideration of effects on development or fertility, and hence a substance can be assigned H362 whether or not the substance is also classified for reproductive toxicity.

3.2.2.7. Specific Target Organ Toxicity

Under CLP, reference is made to those specific effects caused by single or repeated exposure to a substance (Specific Target Organ Toxicity or STOT).

These effects refer to significant systemic effects that can impair function, that may be reversible or irreversible, immediate and/or delayed, or which are not specifically addressed by another hazard class (e.g. reproductive toxicity, irritation, carcinogenicity).

Specific target organ toxicity can occur by any route that is relevant for humans, i.e. oral, dermal or inhalation.

Specific Target Organ Toxicity - Single Exposure (STOT-SE)

Specific target organ toxicity (single exposure) is defined as specific, non-lethal target organ toxicity arising from a single exposure to a substance or mixture. STOT-SE should only be assigned when another hazard class (e.g. irritation, acute toxicity) does not cover the observed toxicity more appropriately.

The hazard class Specific Target Organ Toxicity - Single Exposure is differentiated into:

- STOT - Single Exposure, Category 1 and 2; for non-lethal “significant and/or severe toxic effects”
- STOT - Single Exposure, Category 3; for “transient effects” after single exposure, specifically respiratory tract irritation and narcotic effects

Note that there are no guideline values for Category 3, as this is done on a case by case basis using human data and relevant animal studies, according to the classification criteria under CLP.

In order to help reaching a decision about whether a substance shall be classified or not, and to what degree it shall be classified (Category 1 or Category 2), dose/concentration ‘guidance values’ are provided for consideration of the dose/concentration which has been shown to produce significant health effects. The principal argument for proposing such guidance values is that all substances are potentially toxic and there has to be a reasonable dose/concentration above which a degree of toxic effect is acknowledged.

Classification cut-off guideline (LOAEL)				
Exposure route	Dose unit	Cat. 1	Cat. 2	Cat. 3
Oral (rat)	mg/kg _{bw}	≤ 300	300 < C ≤ 2000	expert judgement
Dermal /rat or rabbit)	mg/kg _{bw}	≤ 1000	1000 < C ≤ 2000	
Inhalation (rat)(gas)	ppmV/4 hrs	≤ 2500	2500 < C ≤ 20000	
Inhalation (rat) (vapour)	mg/l/4 hrs	≤ 10	10 < C ≤ 20	
Inhalation (rat) (dust/mist/fume)	mg/l/4 hrs	≤ 1	1 < C ≤ 5	

Specific Target Organ Toxicity - Repeated Exposure (STOT-RE)

This endpoint relates to specific target organ effects arising from repeated exposure to a substance or mixture. All significant health effects that can impair function, that are reversible or irreversible, immediate and/or delayed are classified into either Category 1 or 2. Specific target organ toxicity can occur by any route that is relevant for humans, i.e. oral, dermal or inhalation.

According to CLP, STOT-RE should only be assigned where the observed toxicity is not covered more appropriately by another hazard class (e.g. carcinogenicity, reproductive toxicity).

The purpose of STOT-RE is to identify the primary target organ(s) of toxicity for inclusion in the hazard statement.

In order to help reaching a decision about whether a substance shall be classified or not, and to what degree it shall be classified (Category 1 or Category 2), dose/concentration

‘guidance values’ are provided for consideration of the dose/concentration which has been shown to produce significant health effects. The principal argument for proposing such guidance values is that all substances are potentially toxic and there has to be a reasonable dose/concentration above which a degree of toxic effect is acknowledged.

Also, repeated- dose studies conducted in experimental animals are designed to produce toxicity at the highest dose used in order to optimise the test objective and so most studies will reveal some toxic effect at least at this highest dose. What is therefore to be decided is not only what effects have been produced, but also at what dose/concentration they were produced and how relevant is that for humans.

The guidance values refer to effects seen in a standard 90-day toxicity study conducted in rats. They can be used as a basis to extrapolate equivalent guidance values for toxicity studies of greater or lesser duration, using dose/exposure time extrapolation similar to Haber’s rule for inhalation, which states essentially that the effective dose is directly proportional to the exposure concentration and the duration of exposure. The assessment shall be done on a case-by- case basis; for a 28-day study the guidance values below is increased by a factor of three.

The following table provides classification cut-off values for STOT-RE.

Exposure route	Classification cut-off guideline (LOAEL)		
	Dose unit	Cat. 1	Cat. 2
Oral (rat)	mg/(kg _{bw} *day)	≤ 10	10 < C ≤ 100
Dermal (rat or rabbit)	mg/(kg _{bw} *day)	≤ 20	20 < C ≤ 200
Inhalation (rat) (gas)	ppmV for 6 hrs/day	≤ 50	50 < C ≤ 250
Inhalation (rat) (vapour)	(mg/l) for 6 hrs/day	≤ 0.2	0.2 < C ≤ 1.0
Inhalation (rat) (dust/mist/fume)	(mg/l) for 6 hrs/day	≤ 0.02	0.02 < C ≤ 0.2

3.2.2.8. Aspiration hazard

‘Aspiration’ means the entry of a liquid or solid substance directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory tract. Aspiration of certain UVCB hydrocarbon substances may result in severe acute effects, such as chemical pneumonitis, varying degrees of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.

Classification of a hydrocarbon substance for aspiration hazard is based on reliable animal test data, human evidence or physical properties, specifically if it has a kinematic viscosity of 20.5 mm²/s or less, measured at 40°C. Substances which meet these criteria are classified in Category 1 for aspiration hazard. It is important to note that classification is mandatory for substances which meet the physical/chemical property criteria, and does not require confirmation in standard toxicology studies in animals.

The classification of a substance which exists as an aerosol or mist, for example as found in pressurised cylinders, is made on the basis of whether or not the substance has the potential to form a pool of liquid in the mouth, and thereby be aspirated. A fine aerosol or mist may not form a pool of liquid and is therefore unlikely to present an aspiration hazard.

Aspiration of a substance can occur during ingestion and also if it is vomited following ingestion. Safe handling information, for example on labels or in safety data sheets, should reflect this potential hazard.

3.2.3. Environmental Endpoints

3.2.3.1. Hazardous to the aquatic environment

In CLP, there are basically four classifications available: Acute 1, Chronic 1, Chronic 2, or Chronic 3 (dependent on a combination of the acute or chronic toxicity value with evidence to show a $\log K_{ow} \geq 4$ and/or not rapid biodegradability).

For substances that are not acutely toxic but meet the $\log K_{ow}$ and or biodegradability criteria, a safety net for chronic classification (Chronic 4) is used.

Under CLP, organic substances are considered as ‘rapidly biodegradable’ if one of the following three criteria are met:

- a) if the substance degrades at least 70% (based on dissolved organic carbon) or 60% (based on oxygen depletion or carbon dioxide generation) in 28-day ready biodegradation studies; or
- b) if the ratio of BOD_5 / COD is $\geq 0,5$ where only BOD and COD data are available; or
- c) if there is other convincing scientific evidence available that the substance can be degraded (biotically and/or abiotically) in the aquatic environment to a level $> 70\%$ within a 28-day period.

In CLP, a Multiplying (M) factor has been introduced (CLP Annex I) which is a weighting factor for substances which meet the criteria for classification in Acute Category 1 or Chronic Category 1. The M factor is derived from the lowest toxicity value (e.g. LC_{50} or NOEC) for the substance, and is used for the purposes of calculating the toxicity of mixtures.

The lowest of the available toxicity values between and within the different trophic levels (fish, crustacean, algae/aquatic plants) shall normally be used to define the appropriate hazard category(ies). There are circumstances, however, when a weight of evidence approach is appropriate.

The criteria for classification of a substance as Acute 1 are defined on the basis of acute aquatic toxicity data only (EC_{50} or LC_{50}). Note that, due to the typical use of water accommodated fractions (WAFs) for the dosing of hydrocarbon UVCBs into aquatic media, the toxicity data are reported as EL_{50} (effect loading) or LL_{50} (lethal loading) instead of EC/LC_{50} (effect concentration or lethal concentration). The criteria for classification of a substance into Chronic 1 to 3 follow a tiered approach where the first step is to see if available information on chronic toxicity merits long-term (chronic) hazard classification. With the implementation of the 2nd Adaptation to Technical Progress (ATP) to CLP, chronic toxicity data are used (if available) to determine chronic classification. In absence of adequate chronic toxicity data, the subsequent step is to combine two types of information, i.e. acute aquatic toxicity data and environmental fate data (degradability and bioaccumulation data).

The following tables provide classification cut-off values for environmental classification.

Short-term (acute) aquatic hazard available; no chronic data available

log K _{ow} and biodegradability	< 4 and rapidly biodegradable	≥ 4 and/or not rapidly biodegradable and/or the experimentally determined BCF ≥ 500			
Eco-toxicity Fish 96 h, Crustacea 48h, Algae 72/96h (mg/l)	LL/EL/ErL50 ≤ 1	LL50 ≤ 1	1 < LL50 ≤ 10	10 < LL50 ≤ 100	LL50 > 100
Classification	Acute 1	Acute 1 ; Chronic 1	Chronic 2	Chronic 3	Chronic 4

If chronic data are available:

Biodegradability	Rapidly biodegradable			Not rapidly biodegradable	
Eco-toxicity (mg/l)	NOEL or EL _x ≤ 0.01	0.01 < NOEL or EL _x ≤ 0.1	NOEL or EL _x ≤ 1	NOELR or EL _x ≤ 0.1	0.1 < NOELR or EL _x ≤ 1
Classification	Chronic 1	Chronic 2	Chronic 3	Chronic 1	Chronic 2

Justification for not classifying in Chronic Category 4 is based on measured BCF data ≤ 500 l/kg or a chronic toxicity value of > 1 mg/l. Since bio-concentration studies for Petroleum UVCB substances are not feasible, chronic studies at the limit of water solubility are required to support non classification.

4. NEW HAZARD CLASSES

The four new hazard classes introduced as an amendment to CLP Regulation (EU, 2023) are (in part 3 and 4 of Annex I):

- ED HH - Category 1 and Category 2 (Endocrine disruption for human health)
- ED ENV - Category 1 and Category 2 (Endocrine disruption for the environment)
- PBT (Persistent, Bioaccumulative, Toxic), vPvB (very Persistent, very Bioaccumulative)
- PMT (Persistent, Mobile, Toxic), vPvM (very Persistent, very Mobile)

While the PMT/vPvM hazards are new in EU legislation, the others are already partially covered in other regulatory areas: endocrine disruptors by Plant Protection Products and Biocidal Products Regulations and PBT/vPvB by REACH Regulation.

Companies need to comply with the new rules and update the classification and labelling as following:



An update of the Guidance on the Application of the CLP criteria (ECHA, 2017) - to also include the new hazard classes - is in preparation and planned to be published in mid 2024.

Endocrine disruption for human health

The Commission Delegated Regulation (EU) 2023/707 introduced new hazard classes. in part 3 of Annex I to CLP Regulation the new hazard class has been added: endocrine disruption for human health.

Endocrine disruptor means a substance or a mixture that alters one or more functions of the endocrine system and consequently causes adverse effects in an intact organism, its progeny, populations or subpopulations.

Classification shall be made on the basis of specific criteria and a weight of evidence determination of each of the criteria and an overall weight of evidence determination.

Classification as an endocrine disruptor for human health is made on the basis of an assessment of the total weight of evidence using expert judgment; this means that all available information that bears on the determination of endocrine disruption for human health is considered together.

Substances classified as a function of endocrine interference for human health shall be allocated to one of two categories.

Category 1	Known or presumed endocrine disruptors for human health
Category 2	Suspected endocrine disruptors for human health

Hazard class and category	H-statement	
ED HH 1	EUH380	May cause endocrine disruption in humans
ED HH 2	EUH381	Suspected of causing endocrine disruption in humans

Endocrine disruption for the environment

“Endocrine disruption” means the alteration of one or more functions of the endocrine system caused by an endocrine disruptor - a substance or a mixture that alters one or more functions of the endocrine system and consequently causes adverse effects in an intact organism, its progeny, populations or subpopulations.

Classification shall be made on the basis of specific criteria and a weight of evidence determination of each of the criteria and an overall weight of evidence determination.

Classification as an endocrine disruptor for the environment is made on the basis of an assessment of the total weight of evidence using expert judgment; this means that all available information that bears on the determination of endocrine disruption for the environment is considered together.

Substances classified as a function of endocrine interference for the environment shall be allocated to one of two categories.

Category 1	Known or presumed endocrine disruptors for the environment
Category 2	Suspected endocrine disruptors for the environment

Hazard class and category	H-statement	
ED ENV 1	EUH430	May cause endocrine disruption in the environment
ED ENV 2	EUH431	Suspected of causing endocrine disruption in the environment

Persistent, Bioaccumulative and Toxic or Very Persistent, Very Bioaccumulative properties

A substance is considered a PBT substance when it fulfils the persistence, bioaccumulation and toxicity criteria simultaneously.

The CLP criteria for Persistence (P), Bioaccumulation (B) and Toxicity (T) are almost identical to the ones currently in Annex XIII of the REACH Regulation; the main difference is that according to the CLP a substance shall be considered to fulfil the toxicity criterion (T) if the substance meets the criteria for classification as endocrine disruptor for humans or the environment. Additional guidance on evaluating these properties also under CLP - i.e. how to compare evidence with the CLP criteria - is under development at ECHA.

This hazard class (Persistent, Bioaccumulative and Toxic (PBT) or Very Persistent, Very Bioaccumulative (vPvB) properties) shall apply to all organic substances, including organo-metals.

Persistence

The “Persistent” criterion (P) is fulfilled when any of the following conditions is met:

The degradation half-life in:				
marine water	fresh or estuarine water	marine sediment	fresh or estuarine water sediment	in soil
is higher than				
60 days	40 days	180 days	120 days	120 days

The “very Persistent” criterion (vP) is met when any of the following conditions is met:

The degradation half-life in:		
marine, fresh or estuarine water	marine, fresh or estuarine water sediment	in soil
is higher than		
60 days	180 days	180 days

Bioaccumulation

The “Bioaccumulative” criterion (B) is fulfilled when the bioconcentration factor (BCF) in aquatic species is higher than 2 000.

The “very Bioaccumulative” criterion (vB) is met when the bioconcentration factor (BCF) in aquatic species is higher than 5 000.

A substance shall be considered a vPvB substance when it fulfils both criteria for “very persistent” and “very bioaccumulative”.

Toxicity

The “Toxic” criterion (T) is met in any of the following situations:

- the long-term no-observed effect concentration (NOEC) or EC_x (e.g. EC₁₀) for marine or freshwater organisms is less than 0,01 mg/l;
- substance is classified carcinogenic (cat. 1A or 1B), germ cell mutagenic (cat. 1A or 1B), or toxic for reproduction (cat.1A, 1B, or 2) ;

- there is other evidence of chronic toxicity, as identified by the substance being classified as STOT RE category 1 or 2;
- the substance is classified as endocrine disruptor (category 1) for humans or the environment

Hazard class and category	H-statement	
PBT	EUH440	Accumulates in the environment and living organisms including in humans
vPvB	EUH441	Strongly accumulates in the environment and living organisms including in humans

Persistent, Mobile and Toxic or Very Persistent, Very Mobile properties

A substance shall be considered a PMT substance when it fulfils the persistence, mobility and toxicity criteria simultaneously.

Persistence (P and vP) and **Toxicity** (T) criteria are the same as described above.

This hazard class (PMT and vPvM properties) shall apply to all organic substances, including organo-metals.

Mobility

The “Mobile” criterion (M) is met when the log K_{oc} is less than 3. For an ionisable substance, the mobility criterion shall be considered fulfilled when the lowest log K_{oc} value for pH between 4 and 9 is less than 3.

The “very Mobile” criterion (vM) is met when the log K_{oc} is less than 2. For an ionisable substance, the mobility criterion shall be considered fulfilled when the lowest log K_{oc} value for pH between 4 and 9 is less than 2.

A substance shall be considered a vPvM substance when it fulfils both criteria for “very Persistent” and “very Mobile”.

Hazard class and category	H-statement	
PMT	EUH450	Can cause long-lasting and diffuse contamination of water resources
vPvM	EUH451	Can cause very long-lasting and diffuse contamination of water resources

5. SPECIAL CONSIDERATIONS FOR CONCAWE UVCB HYDROCARBON SUBSTANCES

UVCB hydrocarbon substances are complex combinations of individual hydrocarbons, which present a number of challenges when applying the methods and legislative criteria developed for the hazard classification of single chemical substances. The EU refiners have developed approaches and methodologies to characterise the hazard potential of their substances. These are described below along with other important considerations from CLP relating to the petroleum industry.

5.1. GROUPING/CATEGORY APPROACH

Refiners take feedstocks from many sources to process into valuable products. Historically these feedstocks have been crude oil and natural gas condensates but increasingly include alternative sources, such as fatty acid-based oils and fats, waste or byproduct bio-oils, the products of pyrolysis of biomass and waste plastics, and chemical feedstocks such as methanol.

In refining operations, feedstocks are subject to fractionation, conversion and treating processes that yield hydrocarbon substances. These hydrocarbon substances are complex combinations of hydrocarbons consisting predominantly of saturated, olefinic and aromatic hydrocarbons, but may also contain small amounts of nitrogen, oxygen and sulphur compounds. Hydrocarbon substances are used in a variety of applications, with the major proportion being used in the production of hydrocarbon transport fuels.

Due to their method of production and complex composition, it is not possible to characterise hydrocarbon substances in terms of their exact chemical composition, molecular formula or structure. They are grouped together according to the process by which they are being manufactured and basic physical-chemical properties. Similar conversion and/or separation processes will result in hydrocarbon substances of broadly similar composition. The resulting groups of hydrocarbon substances have been used by the European Commission for the purposes of compiling Annex 1 to the Existing Substances Regulation (published in the Official Journal L84 on 5 April 1993), Annex XVII of REACH and Annex VI of CLP. The groups have also been used during discussions on EU harmonised classification and labelling and for some endpoints (particularly carcinogenicity) harmonised 'group' classifications have been applied to individual hydrocarbon substances. In the USA, hydrocarbon substances have also been grouped in categories for the purposes of the High Production Volume (HPV) Chemicals programme. The approach is broadly similar to that used in Europe, and has been accepted by the US EPA.

Under CLP and REACH it is possible to group substances together into categories where their physical hazards, human and environmental toxicological properties and environmental fate properties are likely to be similar or follow a regular pattern as a result of structural similarities. UVCB hydrocarbon substances can be grouped together according to the processes by which they are manufactured and basic physical properties.

In this report, the category approach has been applied to physical, toxicological and ecotoxicological endpoints for the purposes of hazard classification. To take account of the variable composition of UVCB hydrocarbon substances hazard properties of the category are determined, and a precautionary approach is used to assign the most severe potential hazard classification appropriate for the category, unless specific derogation conditions (designated by Notes or classification criteria) are met.

5.2. CLASSIFICATION AND LABELLING OF UVCB HYDROCARBON SUBSTANCES - 'SPECIAL TESTING CONSIDERATIONS'

The inherent compositional variability of UVCB hydrocarbon substances means that use of conventional testing methodologies may not provide the most reliable data from which to derive hazard classification. This is particularly true for physical/chemical properties which are better characterized as ranges than single point values and for environmental endpoints which are difficult due to the complex compositions of the substances and the variable water solubility of individual constituents. In contrast, the conventional toxicological testing methodologies can normally be used without modification.

For health and environmental testing of UVCB hydrocarbon substances, the outcome depends upon the nature and concentration of the substance to which the organism or test system is exposed. Testing methodologies have been modified to take these factors into account (e.g., the modified Ames test and Water Accommodated Fraction approach to aquatic toxicity testing). For the environment, models to predict aquatic toxicity of hydrocarbon UVCBs, based on Quantitative Structure Activity Relationships (QSARs), have recently become available. However, only experimental data are used to determine the classification of UVCB hydrocarbon substance categories following a worst case approach.

5.3. HARMONISED CLASSIFICATIONS

The EU harmonised classification of UVCB hydrocarbon substances, where these are established, are included in Table 3 of Annex VI to CLP, which indicate the minimum mandatory classification of substances, for the specified endpoints, according to CLP criteria. The harmonised classifications must be used, except where a regulatory Note applies (Annex VI, 1.1.3).

In addition, for hazard endpoints where no EU harmonised classification exists, this report provides proposals for the self-classification of UVCB hydrocarbon substances in the EU/EEA. This is in line with the provisions of Article 4 (3) of CLP.

5.4. SELECTION OF PRECAUTIONARY STATEMENTS

CLP requires the allocation of selected precautionary statements (P-statements) for use on labels. These are standardised phrases describing the recommended handling measures required to minimise or prevent adverse environmental, health or physical effects resulting from exposure to a hazardous substance or mixture during its use or disposal.

Container labels should include relevant P-statements (as defined in CLP, Article 22). The complete set of P-statements associated with each specific hazard classification, can be found in CLP Annex I, as amended, parts 2 to 5.

The hazard classification of the substance determines the applicable P-statements. Normally, no more than six P-statements should appear on the label, unless necessary to reflect the nature and the severity of the hazards. Guidance on the selection of P-statements has been published by ECHA (ECHA, 2021). This guidance identifies each P-statement for each hazard class and category as either: Highly Recommended, Recommended or Optional, and indicates that suppliers need to allocate statements based on knowledge of substance use and hazard profile.

When a hazardous substance is supplied to the general public, one P-statement addressing the disposal of that substance or mixture as well as the disposal of packaging shall appear on the label. However, a P-statement addressing disposal shall not be required when it is

clear that the disposal of the substance or the packaging does not present a hazard to human health or the environment.

CLP (Annex IV) lists the correct wording of the P-statements as they should appear on the label. H- and P-statements should be grouped together on the label.

Furthermore, flexibility in the application of precautionary phrases is provided, by possible combinations or consolidations of listed P-statements if deemed to ensure improved readability, clarity and comprehensibility of label information. Also, P-statements on labels or in safety data sheets may incorporate minor textual variations from those set out in Annex IV provided that they assist in communicating safety information and the safety advice is not diluted or compromised (e.g. spelling variations, synonyms or equivalent terms appropriate to the region where the product is supplied and used; EU, 2019).

In the Category specific recommendations in this report, all associated P-statements are shown for completeness. Those statements shown in bold, have been selected and recommended by Concawe for the label, and are applicable for the default, most severe hazard classification.

Please note that several P-statements (e.g., P210, P241, P264, P280, P321, P501, etc.) are incomplete and require the manufacturer/supplier to supplement the phrase with the required information.

5.5. REGULATORY AND OIL INDUSTRY NOTES

The preferred method for hazard classification of UVCB hydrocarbon substances is to use data on the UVCB substance itself, where available (see example in **Appendix 4**). For certain human health hazard endpoints classification is driven by the presence of specific hazardous constituents that are themselves classified, and for which general or specific concentration limits exist. An example is the classification of naphtha petroleum streams as carcinogens on the basis of their benzene content.

For some categories of UVCB hydrocarbon substances, ‘markers’ have been identified which take into account the variable compositions of UVCB hydrocarbon substances; for these substances, human health hazard classification is addressed by the use of “Notes”. The regulatory Notes, as laid down in Annex VI to CLP, are applicable to the classification of certain UVCB hydrocarbon substances as described in **Appendix 2**.

It is important to recognise that these regulatory Notes only apply to specific UVCB hydrocarbon substances in Annex VI to CLP. In addition to the regulatory Notes, Concawe has developed a series of Oil Industry Notes (OIN), which also deal with hazardous properties which may be associated with UVCB hydrocarbon substances and need to be considered when determining the hazard classifications. As a worst-case, the most severe hazard classifications must be applied, unless the conditions of the OIN have been met. This is consistent with the approach used with the regulatory Notes. The OINs are also listed in **Appendix 2**.

For example, regulatory Note P applies to most of the CAS RNs in the Low Boiling Point Naphthas (Gasoline) Category that appear in Annex VI. OIN P was developed for the remaining CAS RNs in the Low Boiling Point Naphthas (Gasoline) Category not covered by the regulatory Note P.

Additionally, new OINs are developed for the C&L permutations based on cumene content for Kerosines (Kerosine) Category and MK-1, as well as for substances in Low Boiling Point

Naphthas (Gasoline) Category when the regulatory Note P or OIN P apply (benzene content <0,1%w/w).

5.6. SUPPLY AND TRANSPORT LABELLING

5.6.1. Content of the label

A hazardous substance supplied in packaging must be labelled according to CLP rules. Anyone placing a substance on the market shall make sure that it is correctly labelled. The label should be written in the official language(s) of the Member State(s) in which the product is sold. The overall label sizes vary according to the capacity of the container, as described in section 1.2.1 of CLP Annex I. The label shall include specific information, namely: supplier name, address, telephone number, together with product identifier. For substances, the product identifier should be the same as that used in the SDS, as described in CLP Article 18.

In addition, the label should include the signal word and hazard pictograms; the pictograms are a square set at a point (diamond) with a black symbol on a white background with a red border. Each pictogram should cover at least 1/15 of the surface area of the label but not be smaller than 1 cm². Associated hazard statements are also included, along with the most suitable (normally not more than six) precautionary statements. The principles of precedence for pictograms, hazard and precautionary statements are described in CLP Articles 26-28.

Specific label requirements for transported gas cylinders, gas containers intended for propane, butane or liquefied petroleum gas, aerosols and containers fitted with a sealed spray attachment and containing substances classified as hazardous if aspirated are described in section 1.3 of CLP Annex I.

Under certain circumstances there may be a need to include additional or supplemental information on the label or container. This report does not provide a comprehensive inventory of the additional information that may be needed. Companies are encouraged to review relevant legislation for their products to identify any supplemental information requirements.

Specific examples which appear in REACH Annex XVII, and are directly relevant to UVCB hydrocarbon substances are as follows:

- The packaging of substances that are subject to EU harmonised classifications for germ cell mutagenicity, carcinogenicity or reproductive toxicity (CLP Category 1A or 1B, that are used for non-fuel purposes "must be marked visibly, legibly and indelibly as follows: Restricted to professional users".
- UVCB hydrocarbon substances, such as kerosines, classified for aspiration hazard (H304) and sold as lamp oils for use by the general public must be "visibly, legibly and indelibly marked as follows: Keep lamps filled with this liquid out of the reach of children. Just a sip of lamp oil – or even sucking the wick of lamps – may lead to life-threatening lung damage".
- UVCB hydrocarbon substances, such as kerosines, classified for aspiration hazard (H304) and sold as grill lighter fluids for use by the general public must be "visibly, legibly and indelibly marked as follows: Just a sip of grill lighter may lead to life-threatening lung damage".

5.6.2. Interaction with transport labelling

A provision included in CLP is the possibility to combine the supply label with the transport label. Transportation of dangerous goods requires a pictogram sized at least 10x10 cm, which in many cases may not be fulfilled by the CLP pictogram. The transport pictogram can be used to replace the equivalent CLP pictogram, or both (transport and CLP) can be presented on the outer or single packaging. For substances that are classified as hazardous under CLP, but not classified as dangerous goods (for transport), both the inner (and any intermediate) and the outer packaging must have only a CLP label.

For dangerous goods transported in limited/excepted quantities, the respective marks are considered as transport labelling. Therefore, a CLP label is not required when those marks are attached on the outer packaging, but still may be used if desired.

For substances classified as dangerous goods for transport, class 9, due to the aquatic toxicity of the product, class 9 transport label and environmentally hazardous substance mark are needed on the transport label, the latter replacing the CLP pictogram GHS09.

5.7. SAFETY DATA SHEET - IMPACT OF CLP

The EU requirements for Safety Data Sheets (SDSs) are included in the latest updated version of Annex II of REACH.

CLP requires that all substances and mixtures must be classified according to its criteria.

The CLP classifications of substances of a product that are addressed in the SDSs need to be consistent with the classification that is included in the C&L Inventory notification and/or the REACH registration dossiers. In addition, the classification of the product must be consistent with the classification on its actual label.

An updated Concawe guidance on safety data sheets (Concawe, 2022b) is published on the Concawe website (<https://www.concawe.eu/publications/concawe-reports/>).

5.8. DOWNSTREAM LEGISLATIVE IMPACT OF CLP ON OPERATIONS

Changes to the hazard classification of substances under CLP may have consequential impact via other EU legislation (downstream legislation). Therefore, further legislative proposals have been adopted, or are being prepared, which will adapt classification-based provisions to reflect the new criteria and hazard classifications under CLP. These combined legislative changes will impact Petroleum industry operations throughout the supply chain.

CLP modifies and introduces new hazard classes. These changes require review of existing classification and label of UVCB hydrocarbon substances and consequently their registration dossiers. If new classification is applied the review should impact also workplace health, environmental risk assessments, new risk management measures for human health and environment, label elements for packaged products, workplace hazard signs and SDS.

The European Commission concluded in 2008 that effects of introducing CLP can be minimised by appropriate changes to particular downstream legislation. The necessary changes to REACH have been implemented by CLP (EU, 2011a, b). However, for Council Directive 2012/18 on the control of major-accident hazards involving dangerous substances (Seveso III Directive; EU, 2012b), the implementation of CLP was expected to

have a more substantial impact. **Appendix 3** of this report contains an extended list of EU downstream original legislation impacted by changes of CLP based on the 2008 assessment. The review process of EU Chemicals legislation under the EU Chemicals Strategy on Sustainability has been communicated to introduce further major changes on REACH and CLP (EU, 2020c).

5.9. CLASSIFICATION AND LABELLING INVENTORY

The European Chemicals Agency (ECHA) was established for the purpose of managing the introduction and implementation of REACH and CLP. In addition to providing industry and Member States with guidance and tools on how to comply with the obligations of CLP, ECHA is required to:

- establish and maintain a classification and labelling inventory in the form of a database called the ‘classification and labelling inventory’ (C&L Inventory),
- receive notifications to the C&L Inventory,
- receive proposals for the harmonised classification of a substance from Member State Competent Authorities and suppliers, and submit an opinion on such proposals for classification to the Commission,
- receive, evaluate and decide upon the acceptability of requests to use an alternative chemical name,
- prepare and submit to the Commission draft exemptions from the labelling and packaging requirements.

Hazardous substances that are not subject to REACH registration and are placed on the market must also be notified. This includes hazardous UVCB hydrocarbon substances that are manufactured / imported in quantities less than 1 tonne per annum / legal entity, or are exempt from the obligation to register according to REACH (it includes Crude Oil). Since petroleum coke is not classified as hazardous and exempt from REACH registration, there is no requirement to make a notification to the C&L Inventory.

Obligation to notify ECHA

All of the requirements for notification to the C&L Inventory are provided in CLP (Articles 39 - 42). The obligation to notify applies to ‘manufacturers’ or ‘importers’, or a member of a group of manufacturers or importers, who place a substance on the market if that substance is:

- subject to registration under REACH (≥ 1 tonne/year) and placed on the market,
- classified as hazardous under CLP and placed on the market, irrespective of the tonnage,
- classified as hazardous under CLP and present in a mixture above the concentration limits specified in CLP, which results in the classification of the mixture as hazardous, and the mixture is placed on the market.

The following information is required for it to be included in the C&L Inventory:

- (a) the identity of the notifier(s) responsible for placing the substance on the market;
- (b) the identity and composition of the substance;
- (c) the classification of the substance in accordance with CLP;
- (d) where a substance has been classified in some but not all hazard classes, an indication of whether this is due to lack of data, inconclusive data, or data which are conclusive although insufficient for classification;
- (e) specific concentration limits or M-factors, where applicable;
- (f) the label elements (hazard pictograms, signal words and hazard statements together with any supplemental hazard statements).

The information listed above, must be updated and notified to ECHA when new information becomes available that leads to a change in the classification and labelling of the substance.

5.9.1. Format for notification

The C&L Inventory notification can be provided either online using the REACH-IT tool or it can be created using latest version of IUCLID (International Uniform Chemical Information Database) and submitted via REACH-IT.

5.9.2. Agreed entries

The notifiers and registrants of the same substance must make every effort to come to an agreed entry to be included in the C&L Inventory.

5.9.3. Timing - notification deadline

For those substances placed on the market, the C&L Inventory notification must be submitted within one month.

5.10. CLP UPDATING PROCESS

The work on GHS started with the aim of providing a single, globally harmonized system to address hazard classification of chemicals, development of warning labels, and safety data sheets. It was recognised however that because of the diversity of classification schemes in different countries this was not an instantly achievable goal and hence global harmonisation will be promoted over time.

The current UN GHS scheme includes the technical output from a number of working groups:

- The International Labour Organization (ILO) for the hazard communication.
- The Organization for Economic Cooperation and Development (OECD) for the classification of health and environmental hazards.
- The United Nations Sub-Committee of Experts on the Global Harmonized System (UNSCEGHS).
- The United Nations Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG) and the ILO for the physical hazards.

The first edition of GHS was published in 2003, having been adopted in December 2002. GHS documentation published by the United Nations is regarded as a living document with revision and improvements being published on a two yearly cycle.

Since the GHS text comes from the United Nations and is the product of international negotiations, future amendments to the UN GHS 'Purple Book' will require amendment of CLP. The European Commission has committed to maintain alignment of CLP with the 'Purple Book' so regular updates are anticipated.

In addition, the European Commission will publish amendments to Annex VI (the list of harmonised classifications) through the ATP process. New or revised harmonised classifications will be subject to formal adoption dates for compliance, as published in the ATP.

On the longer term, for the implementation of the European Green Deal, the *Chemicals Strategy For Sustainability* (EU, 2020c) is to set out a number of actions that require,

among others, a targeted revision of the CLP. Various options will be analysed in an impact assessment and, based on the results, the Commission will present legislative proposals for CLP revision, both in the enacting terms and the annexes.

This Concawe report will be reviewed and updated periodically as the registration dossiers are revised, changes to GHS are implemented in CLP or new ATPs with effect on UVCB hydrocarbon substances are enacted.

6. GLOSSARY

ATPs	Adaptations to Technical Progress
CLP	Classification, Labelling and Packaging
DMSO	dimethyl sulfoxide
ECHA	European Chemicals Agency
EUH	supplemental hazard statements
ILO	International Labour Organization
IUCLID	International Uniform Chemical Information Database
M factor	Multiplying factor
MI	Mutagenicity Index
MLA	Mouse Lymphoma Assays
OECD	Organization for Economic Cooperation and Development
OIN	Oil Industry Notes
PAC	Polycyclic Aromatic Compounds
PAHs	polycyclic aromatic hydrocarbons
QSARs	Quantitative Structure Activity Relationships
REACH	Registration, Evaluation and Authorisation of Chemicals
SDSs	Safety Data Sheets
SE	Single Exposure
SIEF	Substance Information Exchange Fora
STOT	Specific Target Organ Toxicity
UNCED	United Nations Conference on the Environment and Development
UN GHS	United Nations Global Harmonised System
UNSCEGHS	United Nations Sub-Committee of Experts on the Global Harmonized System
UNSCETDG	United Nations Sub-Committee of Experts on the Transport of Dangerous Goods
UVCB substances	Substances of Unknown or Variable composition, Complex reaction products or Biological materials

7. REFERENCES FOR BODY OF REPORT

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified Salmonella mutagenicity assay. *Cell Biology and Toxicology* **2**, 1, 63-84

Concawe (2022a) Hazard classification and labelling of petroleum substances in the European Economic Area - 2021. Report No. 1/22. Brussels: Concawe

Concawe (2022b) Guidance on the compilation of Safety Data Sheets for Petroleum Products. Report no. 9/22. Brussels: Concawe

ECHA (2017) Guidance on the application of the CLP criteria. Guidance to Regulation (EC) No 1272/2008 on classification, labelling and packaging (CLP) of substances and mixtures. Version 5.0 July 2017

ECHA (2019): Introductory Guidance on the CLP Regulation. Version 3.0, January 2019. https://echa.europa.eu/documents/10162/23036412/clp_introductory_en.pdf/b65a97b4-8ef7-4599-b122-7575f6956027

ECHA (2021) Guidance on labelling and packaging in accordance with Regulation (EC) No 1272/2008” Version 4.2 March 2021

EU (2006) Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No. 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Official Journal of the European Union No. L396, 30.12.2006, as corrected by Official Journal of the European Union No. L136, 29.05.2007 and as further amended

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 (Initial CLP). The further amendments described below:

EU (2009) Commission Regulation (EC) No. 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L235, 05.09.2009 (1st ATP to CLP)

EU (2011) Commission Regulation (EU) No. 286/2011 of 10 March 2011 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L83, 30.03.2011 (2nd ATP to CLP)

EU (2012a) Commission Regulation (EU) No. 618/2012 of 10 July 2012 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L179, 11.07.2012 (3rd ATP to CLP)

EU (2012b) Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (Seveso III). Official Journal of the European Union No. L197, 24.07.2012

EU (2013a) Commission Regulation (EU) No. 487/2013 of 8 May 2013 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L149, 01.06.2013 (4th ATP to CLP)

EU (2013b) Commission Regulation (EU) No. 758/2013 of 7 August 2013 correcting Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L216, 10.08.2013 (corrections to 1st ATP to CLP)

EU (2013c) Commission Regulation (EU) No 944/2013 of 2 October 2013 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L261, 03.10.2013 (5th ATP to CLP)

EU (2014) Commission Regulation (EU) No 605/2014 of 5 June 2014 amending, for the purposes of introducing hazard and precautionary statements in the Croatian language and its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L167, 05.06.2014 (6th ATP to CLP)

EU (2015) Commission Regulation (EU) 2015/1221 of 24 July 2015 amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, for the purposes of its adaptation to technical and scientific progress. Official Journal of the European Union No. L197, 25.07.2015 (7th ATP to CLP)

EU (2016a) Commission Regulation (EU) 2016/918 of 19 May 2016 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L156, 14.06.2016 (8th ATP to CLP)

EU (2016b) Commission Regulation (EU) 2016/1179 of 19 July 2016 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L195, 20.07.2016 (9th ATP to CLP)

EU (2017) Commission Regulation (EU) 2017/776 of 4 May 2017 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Official Journal of the European Union No. L116, 5.05.2017 (10th ATP to CLP)

EU (2018a) Commission Regulation (EU) 2018/669 of 16 April 2018 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and

packaging of substances and mixtures. Official Journal of the European Union No. L115, 4.05.2018 (11th ATP to CLP)

EU (2018b) Commission Regulation (EU) 2018/1480 of 4 October 2018 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures and correcting Commission Regulation (EU) 2017/776; Official Journal of the European Union No. L 251, 5.10.2018 (13th ATP to CLP)

EU (2019) COMMISSION REGULATION (EU) 2019/521 of 27 March 2019 amending, for the purposes of its adaptation to technical and scientific progress Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures; Official Journal of the European Union No. L 26, 28.3.2018 (12th ATP to CLP)

EU (2020a) COMMISSION DELEGATED REGULATION (EU) 2020/217 of 4 October 2019 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures and correcting that Regulation; Official Journal of the European Union No. L44, 18.02.2020 (14th ATP to CLP)

EU (2020b) COMMISSION DELEGATED REGULATION (EU) 2020/1182 of 19 May 2020 amending, for the purposes of its adaptation to technical and scientific progress, Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures; Official Journal of the European Union No. L 261, 11.08.2020 (15th ATP to CLP)

EU (2020c) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Chemicals Strategy for Sustainability Towards a Toxic-Free Environment. COM(2020) 667 final. Brussels, 14.10.2020.

<https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>

EU (2021a) Commission Delegated Regulation (EU) 2021/643 of 3 February 2021 amending, for the purposes of its adaptation to technical and scientific progress, Part 1 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures; Official Journal of the European Union No. L 133, 20.04.2021 (16th ATP to CLP)

EU (2021b) Commission Delegated Regulation (EU) 2021/849 of 11 March 2021 amending, for the purposes of its adaptation to technical and scientific progress, Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures; Official Journal of the European Union No. L188, 28.05.2021 (17th ATP to CLP)

EU (2022) Commission Delegated Regulation (EU) 2022/692 of 16 February 2022 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures; Official Journal of the European Union No. L 129, 3.5.2022 (18th ATP to CLP)

EU (2023) Commission Delegated Regulation (EU) 2023/707 of 19 December 2022 amending Regulation (EC) No 1272/2008 as regards hazard classes and criteria for the classification, labelling and packaging of substances and mixtures Official Journal of the European Union No. L 93, 31.3.2023

IP (1993) Polycyclic aromatics in petroleum fractions by dimethyl sulphoxide - refractive index method, test method designation IP 346/80. In: IP Standards for UVCB hydrocarbon substances and its Products. Part I: Methods of Analysis and Testing. Volume 2. 53rd Annual Edition. London: Institute of Petroleum

UN (2021) Globally harmonized system of classification and labelling of chemicals (GHS). Ninth revised edition, 2021. New York and Geneva: United Nations;
https://unece.org/sites/default/files/2021-09/GHS_Rev9E_0.pdf

8. CLASSIFICATION AND LABELLING RECOMMENDATIONS

The classification and labelling recommendations found in the following sections reflect the ‘default’ hazard classifications that are recommended for all substances in the category. Concawe has decided to define the default as the most severe classification for the category based on the identified hazards. In order to ‘downgrade’ to a less severe classification, it is necessary to ensure that the appropriate classification criteria and/or conditions specified in the applicable regulatory Notes and Oil Industry Notes have been satisfied. If a less severe classification is applied, this will reduce the number of H- and P-Statements, which will change the information that needs to appear in the safety data sheets and on the labels.

This report provides a framework to achieve an industry harmonised hazard classification for UVCB hydrocarbon substances in the EU, where appropriate. Concawe recommends that Companies apply the ‘default’ hazard classifications included in this report and only vary the classification if the conditions of the regulatory and Oil Industry Notes are met.

8.1. CRUDE OILS (CRUDEOIL)

Definition / Domain: Raw petroleum extracted in natural state from the ground is a complex combination of hydrocarbons containing predominantly aliphatic, alicyclic, and aromatic hydrocarbons within carbon number range from C4 to C60+. It may also contain small amounts of nitrogen, oxygen, and sulphur compounds. It may also contain parts-per-million of organometallic complexes, especially of nickel and vanadium, and dissolved gases, such as hydrogen sulfide.

Similar constituents are present in all Crudeoil but their proportions can vary widely depending on the source.

As shown in **Appendix 1**, in spite of the complex composition, Crudeoil is assigned a single EC number (232-298-5); if not chemically modified, it is exempt from REACH registration but still subject to CLP notification.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Crudeoil is liquid.

Flammable Aerosol: Not relevant - Crudeoil is liquid.

Flammable Liquid: Crudeoil is liquid, with flash point < 23°C and initial boiling point ≤ 35°C as well as spanning the range to flashpoints >60°C.

Flammable Solid: Not relevant - Crudeoil is liquid.

Oxidising Gas: Not relevant - Crudeoil is liquid.

Oxidising Liquid: Crudeoil is not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - Crudeoil is liquid.

Pyrophoric Liquid: Crudeoil does not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - Crudeoil is liquid.

Self-reactive Substance: Crudeoil is not self-reactive. It does not undergo exothermic decomposition when heated.

Self-heating Substance: Crudeoil does not react exothermically.

Gas under Pressure: Not relevant - Crudeoil is liquid.

Organic Peroxide: Crudeoil does not meet the definition of a peroxide.

Corrosive to Metal: Crudeoil does not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Crudeoil does not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Crudeoil have been tested in acute oral and dermal studies. Results indicate the following (Mobil 1984a,b,c,d,e,f; Mobil 1990a,b):

Rat oral	LD ₅₀ > 5000 mg/kg _{bw}
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw}

The acute inhalation hazard of Crudeoil is most likely from hydrogen sulfide. The acute toxicity of hydrogen sulfide assessed in rats, resulted in a calculated LC₅₀ for a 4-hour inhalation exposure of 444 ppm. Volatile organic compounds from Crudeoil are similar to the hydrocarbons found in gasoline blending streams; for these, testing results indicate no acute toxicity by inhalation exposure route (API 2011):

Rat inhalation LC₅₀ > 5000 mg/m³ (in the absence of hydrogen sulfide)

Skin Corrosion / Irritation: Skin irritation was tested in rabbits and showed no evidence of skin irritation or corrosion. Upon repeated exposure Crudeoil may cause skin dryness or cracking (Mobil 1985d,e,f; Mobil 1990a,b).

Serious Eye Damage / Irritation: Data indicate Crudeoil has the potential to cause eye irritation, as evidenced in rabbit studies by the presence of redness of the conjunctiva at 24 hours with a score of 3.7 (Mobil 1985a,b,c; Mobil 1990a,b).

Respiratory or Skin Sensitization: Evaluation of Crudeoil for dermal sensitization in the guinea pig, using the Buehler method, indicates that it was unlikely to cause sensitization (Mobil 1991a,b).

Germ Cell Mutagenicity: The mutagenic potential of Crudeoil has been tested with *in vitro* and *in vivo* assays. *In vitro* tests showed some mutagenic activity. *In vivo* results in the micronucleus assay did not demonstrate cytogenetic activity. Testing for sister chromatid exchanges did show a slight increase in genetic activity. Based on the available data, Crudeoil is not considered to be germ cell mutagens (Mackerer *et al.* 2003; Mobil 1984g,h,i; Mobil 1990c; Mobil 1991 c,d,e; Lockard *et al.* 1982).

Carcinogenicity: The carcinogenicity of Crudeoil has been tested in mouse skin painting studies. Based on the available data Crudeoil is considered to be carcinogenic. (Lewis *et al.* 1984; Clark *et al.* 1988; Renne *et al.* 1981).

Reproductive Toxicity: Crudeoil is not expected to produce significant reproductive toxicity since long-term repeated dermal exposures have not produced adverse effects in the sperm or the reproductive organs of the rats (Mobil 1992a, b; Feuston *et al.* 1997).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity, other than a potential to cause narcosis / CNS depression at higher exposure concentrations (Mobil 1984a,b,c,d,e,f; Mobil 1985a,b,c,d,e,f; Mobil 1990a,b).

Repeated Exposure: Repeated exposure to Crudeoil by the oral or dermal routes has demonstrated systemic toxicity. Target tissues were blood, liver, spleen and thymus (Leighton 1990; Feuston *et al.* 1994,1997; Mobil 1992a,b).

Aspiration: Crudeoil is liquid with viscosity values $\leq 20.5 \text{ mm}^2/\text{s}$ or $> 20.5 \text{ mm}^2/\text{s}$ at 40°C .

1.3 Environmental Hazards

Short-term (acute) Aquatic Hazard: Acute aquatic toxicity studies in fish, invertebrates and algae on samples of Crudeoil show acute toxicity values greater than 1 mg/l and mostly in the range of $2 - >100 \text{ mg/l}$. These tests were carried out on the water accommodated fraction (EMBSI 2002 a,b; Concawe 2001).

Long-term (chronic) Aquatic Hazard: There are no chronic toxicity studies available for Crudeoil, and QSAR toxicity predictions are not used to determine environmental classification.

Environmental fate (biodegradation / bioaccumulation): Crudeoil is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance. Crudeoil is not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Crudeoil show predicted values for $\log K_{ow}$ ranging from less than 4 to greater than 6 and are considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations).

Due to the variability of crude oil composition, the environmental toxicity may differ from that given below; therefore, crude oils can be classified using specific experimental data on the actual type of crude oil under consideration.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

Hazard class	Hazard category	Hazard statement
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...]equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P337 + P313: If eye irritation persists: Get medical advice/attention.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (2011) Crude Oil Category Assessment Document. Submitted to the US EPA; Petroleum HPV Testing Group, Consortium Registration # 1100997. Washington DC: American Petroleum Institute.

Clark, C.R. *et al* (1988) Comparative dermal carcinogenesis of shale and petroleum-derived distillates. *Toxicol Ind Health* 4, 1, 11-22

Concawe (2001) Environmental classification of petroleum substances - summary data and rationale. Report No. 01/54. Brussels: Concawe

EMBSI (2002a) Mysid, acute toxicity test - Chayvo. Study performed for ExxonNeftegas Ltd. Report No.101160. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2002b) Mysid, acute toxicity test - Odoptu. Study performed for ExxonNeftegas Ltd. Report No.121260. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Feuston, M.H. *et al* (1994) Correlation of systemic and developmental toxicities with chemical component classes of refinery streams. *Fund Appl Toxicol* 22, 622-630

Feuston, M.H. *et al* (1997) Systemic toxicity of dermally applied crude oils in rats. *J Toxicol Environ Health* 51, 387-399

Leighton, F.A. (1990) The systemic toxicity of Prudhoe Bay crude and other petroleum oils to CD-1 mice. *Arch Environ Contam Toxicol* 19, 256-262

Lewis, S.C. *et al* (1984) Skin carcinogenic potential of petroleum hydrocarbons: crude oil, distillate fractions and chemical class subfractions. In: Mehlman, M.A. *et al* (Eds). Advances in modern environmental toxicology. Volume VI: Applied toxicology of petroleum hydrocarbons, p. 139-150. Princeton NJ: Princeton Scientific

Lockard, J.M. *et al* (1982) Comparative study of the genotoxic properties of Eastern and Western US shale oils, crude petroleum and coal-derived oil. *Mutation Research* 102, 221-235

Mackerer, C.R. *et al* (2003) Petroleum mineral oil refining and evaluation of cancer hazard. *Appl Occup Environ Hyg* 18, 11, 890-901

Mobil (1984a) The acute dermal toxicity of Arab light crude in albino rabbits. Mobil Environ. and Health Sci. Lab. Study No.40962. Princeton NJ: Mobil Oil Corporation

Mobil (1984b) The acute dermal toxicity of Beryl crude in albino rats. Mobil Environ. and Health Sci. Lab. Study No. 40952. Princeton NJ: Mobil Oil Corporation

Mobil (1984c) The acute dermal toxicity of MCSL crude (Midcontinent) in albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40972. Princeton NJ: Mobil Oil Corporation

Mobil (1984d) The acute oral toxicity of Arab light crude in albino rats. Mobil Environ. and Health Sci. Lab. Study No. 40961. Princeton NJ: Mobil Oil Corporation

Mobil (1984e) The acute oral toxicity of Beryl crude in albino rats. Mobil Environ. and Health Sci. Lab. Study No. 40951. Princeton NJ: Mobil Oil Corporation

Mobil (1984f) The acute oral toxicity of MCSL crude (Midcontinent) in albino rats. Mobil Environ. and Health Sci. Lab. Study No. 40971. Princeton NJ: Mobil Oil Corporation

Mobil (1984g) A modified Ames pre-incubation mutagenesis assay for determination of specific mutagenicity of the DMSO extract of Arab light crude. Mobil Environ. and Health Sci. Lab. Study No. 40965. Princeton NJ: Mobil Oil Corporation

Mobil (1984h) A modified Ames pre-incubation mutagenesis assay for determination of specific mutagenicity of the DMSO extract of MCSL crude (Midcontinent). Mobil Environ. and Health Sci. Lab. Study No. 40975. Princeton NJ: Mobil Oil Corporation

Mobil (1984i) A modified Ames pre-incubation mutagenesis assay for determination of specific mutagenicity of the DMSO extract of Beryl crude. Mobil Environ. and Health Sci. Lab. Study No. 40955. Princeton NJ: Mobil Oil Corporation

Mobil (1985a) Primary eye irritation of Arab light crude in albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40963. Princeton NJ: Mobil Oil Corporation

Mobil (1985b) Primary eye irritation of Beryl crude in albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40953. Princeton NJ: Mobil Oil Corporation

Mobil (1985c) Primary eye irritation of MCSL crude (Midcontinent) in albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40973. Princeton NJ: Mobil Oil Corporation

Mobil (1985d) Skin irritation by Arab light crude after single applications, occluded and non-occluded, on albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40964. Princeton NJ: Mobil Oil Corporation

Mobil (1985e) Skin irritation by Beryl crude after single applications, occluded and non-occluded, on albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40954. Princeton NJ: Mobil Oil Corporation

Mobil (1985f) Skin irritation by MCSL crude (Midcontinent) after single applications, occluded and non-occluded, on albino rabbits. Mobil Environ. and Health Sci. Lab. Study No. 40974. Princeton NJ: Mobil Oil Corporation

Mobil (1990a) Consolidated acute test report on Belridge heavy. Mobil Environ. and Health Sci. Lab. Study No. 63842, 63843, 63844, 63845. Princeton NJ: Mobil Oil Corporation

Mobil (1990b) Consolidated acute test report on Lost Hills light. Mobil Environ. and Health Sci. Lab. Study No. 63830, 63831, 63832, 63833. Princeton NJ: Mobil Oil Corporation

Mobil (1990c) Micronucleus assay of bone marrow red blood cells from rats treated via dermal administration of Lost Hills light. Mobil Environ. and Health Sci. Lab. Study No. 63835. Princeton NJ: Mobil Oil Corporation

Mobil (1991a) Delayed contact hypersensitivity study in guinea pigs (Buehler sensitization test) of Lost Hills light crude oil. Mobil Environ. and Health Sci. Lab. Study No. 63841. Princeton NJ: Mobil Oil Corporation

Mobil (1991b) Delayed contact hypersensitivity study in guinea pigs (Buehler sensitization test) of Belridge heavy crude oil. Mobil Environ. and Health Sci. Lab. Study No. 63853. Princeton NJ: Mobil Oil Corporation

Mobil (1991c) A modified Ames pre-incubation mutagenesis assay for determination of specific mutagenicity of the DMSO extract of Belridge heavy. Mobil Environ. and Health Sci. Lab. Study No. 63850. Princeton NJ: Mobil Oil Corporation

Mobil (1991d) A modified Ames pre-incubation mutagenesis assay for determination of specific mutagenicity of the DMSO extract of Lost Hills light. Mobil Environ. and Health Sci. Lab. Study No. 63838. Princeton NJ: Mobil Oil Corporation

Mobil (1991e) Micronucleus assay of bone marrow red blood cells from rats treated via dermal administration of Belridge heavy. Mobil Environ. and Health Sci. Lab. Study No. 63847. Princeton NJ: Mobil Oil Corporation

Mobil (1992a) Thirteen-week dermal administration of Belridge heavy to rats. Mobil Environ. and Health Sci. Lab. Study No. 63846. Princeton NJ: Mobil Oil Corporation

Mobil (1992b) Thirteen-week dermal administration of Lost Hills light to rats. Mobil Environ. and Health Sci. Lab. Study No. 63834. Princeton NJ: Mobil Oil Corporation

Renne, R.A. *et al* (1981) Epidermal carcinogenicity of some crude fossil fuels in mice: a preliminary report. In: Mahlum, D.D. *et al* (Eds). Coal conversion and the environment, p. 471-481. US Dept. of Energy

8.2. LOW BOILING POINT NAPHTHAS (GASOLINES) (NAPHTHA)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from crude petroleum or separated as a liquid from natural gas.
- Refinery processes
 - atmospheric distillation
 - alkylation
 - isomerisation
 - catalytic cracking
 - thermal cracking
 - catalytic reforming
 - catalytic polymerisation
 - hydrotreatment / hydrodesulphurisation
 - hydrocracking
 - coking
- Hydrocarbon types: saturated, olefinic, aromatic
- Typical boiling point range: approximately 25°C to 200°C
- Typical carbon number range: predominantly C₄ to C₁₂

Appendix 1 lists only those Naphtha substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Naphtha substances are liquids.

Flammable Aerosol: Not relevant - Naphtha substances are not in aerosol form.

Flammable Liquid: Naphtha substances are flammable liquids of variable flash point / initial boiling points.

Flammable Solid: Not relevant - Naphtha substances are liquids.

Oxidising Gas: Not relevant - Naphtha substances are liquids.

Oxidising Liquid: Naphtha substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - Naphtha substances are liquids.

Pyrophoric Liquid: Naphtha substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - Naphtha substances are liquids.

Self-reactive Substance: Naphtha substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Naphtha substances do not react exothermically.

Gas under Pressure: Not relevant - Naphtha substances are liquids.

Organic Peroxide: Naphtha substances do not meet the definition of a peroxide.

Corrosive to Metal: Naphtha substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Naphtha substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of gasoline and other naphtha substances have been tested in acute oral, dermal and inhalation studies. The results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg bw, Sprague-Dawley rats (UBTL, 1986a).
Rat inhalation (vapour)	LC ₅₀ > 5610 mg/m ³ air (analytical), Sprague-Dawley rats (UBTL, 1992).
Rabbit dermal	LD50 > 2000 mg/kg bw, New Zealand White rabbits (UBTL, 1986b).

Although these studies were conducted many years ago, they were generally conducted in accordance with regulatory guidelines and good laboratory practice recommendations. The data is thus considered adequate for regulatory purposes and no additional testing is warranted.

Especially for the acute inhalation toxicity, it is acknowledged that the Key study was only tested up to a targeted nominal concentration of 5 mg/L (at the time the study was conducted, the recognised limit value). This study, along with the weight of evidence from supporting studies, show no mortality at this dose level. Additionally, there are two inhalation repeated tox studies of good reliability (reliability 1) where rats were exposed 6 hours per day for 13 weeks to vapor concentration of naphtha up to levels of 20 mg/L, with no treatment related mortalities. Therefore, no classification for acute inhalation toxicity is warranted.

In conclusion, the data above does not meet the criteria for hazard classification for acute, dermal or inhalation toxicity according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008). However, warnings for aspiration hazard and potential narcotic effects at high concentrations should be considered.

Skin Corrosion / Irritation: Samples of gasoline and a number of other naphtha streams have been tested in New Zealand White rabbit skin irritation studies. The majority of the data were derived using a 24 hour occluded exposure protocol. The degree of dermal irritation observed was variable, ranging from slight to moderate/severe, normally persisting for up to 14 days. There was no evidence of skin corrosion when applied to rabbit skin. Heavier, aromatic materials caused more irritation than lighter, paraffinic streams (API, 1995).

The data can be used without restriction for regulatory purposes and support the classification of gasoline and naphtha streams as Skin Irrit. 2 ;H315 according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Serious Eye Damage / Irritation: The effects of gasoline and naphtha streams have been investigated into New Zealand White rabbits' eyes using a number of samples. There is some evidence of eye irritation associated with vapor exposure at levels equal to and greater than 200 ppm, but the effects were mild, and the dose-response information was not conclusive. There was very little evidence of irritation when these materials were instilled into rabbit eyes (UBTL, 1986d).

Gasoline and naphtha streams do not meet the criteria for classification as an eye irritants according to the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Respiratory or Skin Sensitization: Tests in guinea pigs with gasoline and a number of other Naphtha streams showed no evidence of skin sensitization (UBTL, 1986c). There are no reports available to indicate that Gasoline or other Naphtha streams have the potential to cause respiratory sensitization.

The data can be used without restriction for regulatory purposes and does not support classification as a sensitizer according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Germ Cell Mutagenicity: The mutagenic potential of gasoline and other naphtha substances has been extensively studied in a range of *in vivo* and *in vitro* assays. Although blended gasoline was not mutagenic, either with or without metabolic activation, in *in vitro* test systems, the naphtha streams produced mixed results in *in vitro* gene mutation assays but negative results in *in vivo* assays. The majority of the studies showed no evidence of mutagenic activity (API, 1977; API, 2005 by Huntingdon Life Sciences Laboratory).

Gasoline and other naphtha streams can contain benzene, a constituent that is classified as a germ cell mutagen. Although the data does not support classification of gasoline per se for genotoxic potential according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008), there is a regulatory requirement to classify as genotoxic the gasoline and naphtha streams containing $\geq 0.1\%$ w/w benzene.

Carcinogenicity: The carcinogenic potential of gasoline and other naphtha substances has been investigated in rats and mice following inhalation exposure for 2 years. In rats, there was an increased incidence of kidney tumours in males and in mice there was an increased incidence of liver tumours in females (Kitchen, 1984; IRDC, 1984). Further work has shown that these tumours are sex and species specific and are not considered relevant to humans (Short *et al.*, 1989). Results of 2 year skin painting studies with gasoline and naphtha blending streams have shown either no or weak potential (low incidence and long latent period) for the development of skin tumours. Additional work has shown that where tumours arise they are most likely a result of a non-genotoxic response due to dermal irritation (API, 1983).

Gasoline and other naphtha streams can contain benzene, a constituent that is classified as a human carcinogen. According to EU CLP Regulation ((EC) No. 1272/2008 (EU, 2008)), the data does not support classification of gasoline per se for carcinogenic potential, although there is a regulatory requirement to classify as carcinogenic the gasoline and naphtha streams containing $\geq 0.1\%$ w/w benzene and/or cumene.⁶

Reproductive Toxicity: Results of guideline developmental toxicity studies on gasoline and OECD developmental toxicity screening studies with other naphtha substances showed no evidence of developmental toxicity in Sprague-Dawley rats (Roberts *et al.*, 2001; Mobil, 1988). Similarly, studies in Sprague-Dawley rats with gasoline did not show any effect on fertility performance (McKee *et al.*, 2000; Research Pathology Services, 1998).

Gasoline and other naphtha streams can contain amounts of toluene and/or n-hexane, constituents that are classified as reprotoxicants. Although the data does not provide a basis for classification of gasoline per se for reproductive toxicity potential according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008) and there is no need for additional reproductive toxicity studies to be conducted, there is a regulatory requirement to classify as reprotoxic the gasoline and naphtha streams containing $\geq 3\%$ w/w toluene and/or n-hexane.

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity, other than a potential to cause narcosis / Central Nervous System (CNS) depression at higher exposure concentrations (Drinker *et al.*, 1943; Davis *et al.*, 1960).

Repeated Exposure: The repeat dose toxicity of gasoline and other naphtha streams has been studied in rats following oral, inhalation and dermal exposure for periods between 10 days and up to 2 years. The effects of repeated inhalation exposure of primates to gasoline have also been studied. No adverse effect observed via oral route (Halder *et al.*, 1985). Repeated inhalation exposure causes 'light hydrocarbon nephropathy' in male rats, an effect which is considered to be both sex and species specific (MacFarland *et al.*, 1984, Kuna and Uhlrich, 1984). In dermal studies, no systemic toxicity has been seen; the only effect observed was moderate to severe dermal irritation (API, 1983; UBTL, 1986e).

⁶ The 18th ATP upgrades the harmonised classification of cumene as Carcinogenic 1B by 1st December 2023. The impact on Concawe kerosine and naphtha dossiers has been assessed, and the Concawe classification recommendations are included in the report, as the revised dossiers are released.

The current data is sufficient for regulatory purposes.

According to EU CLP regulation ((EC) No.1272/2008) (EU, 2008), the classification for repeated exposure systemic toxicity is only warranted when naphtha streams contain $\geq 10\%$ w/w benzene. See also **Appendix 4**, which provides some additional context relating to the lack of classification of Low Boiling Point Naphthas containing $\geq 1\%$ w/w but $< 10\%$ w/w benzene for STOT Repeated Exposure.

In addition, Concawe believes that dermal is the most relevant exposure route. However, the primary objective of the testing required for REACH is the identification of hazard, for which the default exposure route under the regulation is oral as this is considered to maximise systemic exposure. To address the regulatory exposure route issue, Concawe will also conduct a number of oral OECD 422 studies on prioritized substances in each relevant category.

Aspiration: Gasoline and other naphtha substances are low viscosity mobile hydrocarbon liquids with a kinematic viscosity at 40°C of $< 20.5 \text{ mm}^2/\text{s}$, meeting the classification criteria of the CLP Regulation ((EC) No. 1272/2008) (EU, 2008) for aspiration hazard.

1.3 Environmental Hazards

Acute (short-term) Hazard: Acute aquatic toxicity studies with fish, invertebrates and algae on samples of gasoline and other naphtha substances show acute toxicity values in the range 1-10 mg/l. These tests were carried out on water accommodated fractions and in closed systems to prevent evaporative loss (EBSI 1995a, b, c; Concawe, 1996; Petroleum Product Steward Council, 1995).

Chronic (long-term) Aquatic Hazard: Chronic toxicity studies on invertebrates (Daphnia) exposed to naphtha substances are available, with a lowest NOELR (21days) value of 2.6 mg/l. This data has been applied as read across for the chronic fish toxicity (Springborn Laboratories, 1999a). The low boiling point naphthas meet the criteria for classification as Toxic to aquatic life with long lasting effects ; H411 according to the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Environmental fate (biodegradation / bioaccumulation): Naphtha substances are hydrocarbon UVCBs. Standard tests for biodegradation / bioaccumulation are intended for single substances and are not appropriate for complex substances. They are characterized using quantitative structure property relationships for representative hydrocarbon structures that comprise the hydrocarbon blocks used to assess the environmental risk with the PETRORISK model. Based on compositional information available and measured or predicted data on key constituents, gasoline and other naphtha substances are not expected to meet the criteria for ready degradability but are inherently biodegradable (Solano-Serena *et al.*, 1999; Springborn Laboratories, 1999b,c,d). Calculated log Pow values for constituents of naphtha substances, range between 1.99 and 18.02. Calculated BCF values for constituents of naphtha substances range between 0.4 and 6280 l/kg and they are considered as potentially bioaccumulative (BCFBAF, 2012).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H340: May cause genetic defects.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*): Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

To provide flexibility in the application of precautionary phrases, combinations or consolidations of precautionary statements are encouraged to save label space and improve readability. The matrix and the Tables in Part 1 of this Annex include a number of combined precautionary statements. However, these are only examples and suppliers may further combine and consolidate phrases where this contributes to clarity and comprehensibility of label information in accordance with Articles 22 and 28(3).

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

In accordance with Annex VI of the CLP Regulation (inclusion from 5th ATP to CLP), the following additional classification applies only to the substance with EC No 265-185-4, CAS No 64742-82-1.

Hazard class	Hazard category	Hazard statement
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Central nervous system	H372: Causes damage to central nervous system through prolonged or repeated exposure.

Note: Additional classification and labelling STOT RE 1 applies case-by-case if benzene content is >10% in Naphtha category substances.

Additional precautionary statements associated to this additional classification are:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions*)

P270: Do not eat, drink or smoke when using this product.

P314: Get medical advice/attention if you feel unwell.

REFERENCES

API (1977) Mutagenicity evaluation of unleaded gasoline. Study conducted by Litton Bionetics. API Med. Res. Publ. 28-30173. Washington DC: American Petroleum Institute

API (1983) Carcinogenic potential of key petroleum products. Study conducted by Eppley Institute for Research in Cancer, University of Nebraska Medical School. API Med. Res. Publ. 30-31646. Washington DC: American Petroleum Institute

API (1995) Primary skin irritation study in rabbits of API 91-01 and PS-6. Unleaded test gasolines. Study conducted by Hill Top Biolabs Inc. API Toxicology Report No. 409. Washington DC: American Petroleum Institute

API (2005) Baseline gasoline vapor condensate: a 13-week whole-body inhalation toxicity study in rats with neurotoxicity assessments and 4-week in vivo genotoxicity and immunotoxicity assessments. Study conducted by Huntingdon Life Sciences. Study No. 00-6125. Washington DC: American Petroleum Institute

BCFBAF (2012): BCFBAF v3.01 (Computer model). Based on Meylan, W.M. et al. (1999): Improved Method for Estimating Bioconcentration / Bioaccumulation Factor from Octanol/Water Partition Coefficient. *Environ. Toxicol. Chem.* **18**(4): 664-672 (1999)

Concawe (1996) Acute aquatic toxicity of gasolines. Report No. 96/57. Brussels: Concawe

Davis, A. et al (1960) The effects on human volunteers of exposure to air containing gasoline vapor. *Arch Environ Health* **1**, 548-554

Drinker, P. et al (1943) The threshold toxicity of gasoline vapor. *J Ind Hyg Toxicol* **25**, 6, 225-232

EBSI (1995a) Alga, growth inhibition test. MRD-95-048 gasoline W94/813, blend. Study performed for Concawe. EBSI Study No. 104867. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995b) Daphnia, acute toxicity test. MRD-95-044 gasoline W94/809, medium naphtha. Study performed for Concawe. EBSI Study No. 104442. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995c) Fish, acute toxicity test -rainbow trout. MRD-95-045 gasoline W94/810, isomate. Study performed for Concawe. EBSI Study No. 104558. East Millstone NJ: Exxon Biomedical Sciences Inc.

Halder, C.A. et al (1985) Hydrocarbon nephropathy in male rats: identification of the nephrotoxic components of unleaded gasoline. *Toxicol Ind Health* **1**, 3, 67-87

IRDC (1984) Motor fuel chronic inhalation study. Unleaded gasoline. Study conducted by IRDC. Report no. 418-003. Washington DC: American Petroleum Institute

Kitchen, D. (1984) Neoplastic renal effects of unleaded gasoline in Fischer 344 rats. In: Mehlman, M.A. et al (Eds). *Advances in modern environmental toxicology. Volume VII: Renal effects of hydrocarbons*, p. 65-71. Princeton, NJ: Princeton Scientific

Kuna RA and Uhlrich CE 1984: Subchronic inhalation toxicity of two motor fuels (publication), *J. Am. Coll. Toxicol.* **3**:217-229. Owner company; American Petroleum Institute

MacFarland, H.N. et al (1984) A chronic inhalation study with unleaded gasoline vapor. *J Am College Toxicol* **3**, 4, 231-248

McKee, R.H. et al (2000) Assessment in rats of the reproductive toxicity of gasoline from a gasoline vapor recovery unit. *Reprod Toxicol* **14**, 4, 337-353

Mobil (1988) Developmental toxicity screen in rats exposed dermally to light catalytically cracked naphtha (LCCN). Mobil Environ. and Health Sci. Lab. Study No. 50341. Princeton NJ: Mobil Oil Corporation

Petroleum Product Stewardship Council (1995) Static-renewal 96-hour acute toxicity study of the water accommodated fraction (WAF) of whole light alkylate product to fathead minnow. Study conducted by Stonybrook Laboratories Inc. Study No. 65908. Washington DC: Petroleum Product Stewardship Council

Roberts, L. et al (2001) Developmental toxicity evaluation of unleaded gasoline vapor in the rat. *Reprod Toxicol* **15**, 5, 487-494

Research Pathology Services (1998) Two generation reproduction study of gasoline vapors in rats with vapour recovery unit condensate. Study performed for Concawe. EBSI Study No. 115235. East Millstone NJ: Exxon Biomedical Sciences Inc.

Short, B.G. et al (1989) Promoting effects of unleaded gasoline and 2,2,4-trimethylpentane on the development of atypical cell foci and renal tubular cell tumors in rats exposed to *N*-ethyl-*N*-hydroxyethyl nitrosamine. *Cancer Research* **49**, 22, 6369-6378

Solano-Serena, F. *et al* (1999) Biodegradation of Gasoline: Kinetics, Mass Balance and Fate of Individual Hydrocarbons. (publication), *J. Appl. Microbiol.* 96, 1006-1016

Springborn Laboratories (1999a) Light alkylate naphtha - full life cycle toxicity test with water fleas, *Daphnia magna*, under static-renewal conditions following OECD Guideline 211. Study No. 13687.0598.6105.130. Wareham MA: Springborn Laboratories Inc.

Springborn Laboratories (1999b): Light Catalytically Reformed Naphtha - Determination of Inherent Biodegradability (study report), Testing laboratory: Springborn Laboratories, Inc., Study number: 13687.6110

Springborn Laboratories (1999c): Light alkylate naphtha-determination of inherent biodegradability (study report), Testing laboratory: Springborn Laboratories, Inc., Study number: 13687.6111

Springborn Laboratories (1999d): Light catalytically cracked naphtha - determination of inherent biodegradability. (study report), Testing laboratory: Springborn Laboratories, Inc., Study number: 13687.6109

UBTL (1986a) Acute oral toxicity study in rats administered test article F-64-01 unleaded premium gasoline. UBTL Study No. 60598. Los Angeles CA: ARCO

UBTL (1986b) Acute dermal toxicity study in rabbits administered test article F-64-01 unleaded premium gasoline. UBTL Study No. 60553. Los Angeles CA: ARCO

UBTL (1986c) Dermal sensitization study in guinea pigs administered test article F-64-01 unleaded premium gasoline. UBTL Study No. 60613. Los Angeles CA: ARCO

UBTL (1986d) Primary eye irritation study in rabbits administered test article F-64-01 Watson unleaded premium gasoline. UBTL Study No. 60583. Los Angeles CA: ARCO

UBTL (1986e) Twenty-eight day dermal toxicity study in rats on test article F-64-01 Watson unleaded premium gasoline. UBTL Study No. 60761. Los Angeles CA: ARCO

UBTL (1992) Acute inhalation toxicity study in rats administered test article #: F-101. Report no.: 65798. Los Angeles CA: ARCO

8.3. KEROSES (KEROSENE)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced. The distillation range of Kerosene substances is such that components of specific toxicological concern such as benzene (boiling point 80 °C) and n-hexane (boiling point 69 °C) are typically only present at trace concentrations. The boiling points of 3 to 7 fused-ring polycyclic aromatic hydrocarbons (PAHs) are above the boiling range of Kerosene substances.

- Derived from crude petroleum
- Refinery processes:
 - atmospheric distillation
 - catalytic cracking
 - thermal cracking
 - hydrocracking
 - hydrotreatment / hydrodesulphurisation
 - catalytic reforming
 - coking
- Hydrocarbon types: the major components include branched and straight chain paraffins and naphthenes (cycloparaffins), and aromatic hydrocarbons (alkylbenzenes and alkylnaphthalenes).
- Typical boiling point range: approximately 90 °C to 320 °C
- Typical carbon number range: predominantly C₆ to C₁₇

Appendix 1 lists only those Kerosene substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Kerosene substances are liquids.

Flammable Aerosol: Not relevant - Kerosene substances are not in aerosol form.

Flammable Liquid: Kerosene substances are liquids of variable flash point. Typically with a flash point range of $\geq 23^{\circ}\text{C}$ and $\leq 70^{\circ}\text{C}$.

Flammable Solid: Not relevant - Kerosene substances are liquids.

Oxidising Gas: Not relevant - Kerosene substances are liquids.

Oxidising Liquid: Kerosene substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - Kerosene substances are liquids.

Pyrophoric Liquid: Kerosene substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - Kerosene substances are liquids.

Self-reactive Substance: Kerosene substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Kerosene substances do not react exothermically.

Gas under Pressure: Not relevant - Kerosene substances are liquids.

Organic Peroxide: Kerosine substances do not meet the definition of a peroxide.

Corrosive to Metal: Kerosine substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Kerosine substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Jet Fuel and other Kerosine substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (ARCO, 1992c)
Rat inhalation (vapour)	LC ₅₀ > 5.28 mg/l (API, 1987)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (ARCO, 1992b)

Skin Corrosion / Irritation: Samples of Jet Fuel and a number of other Kerosine substances have been tested in rabbit skin irritation studies. The degree of irritancy is substance-, dose- and exposure-time dependent. The kerosines and jet fuels range from essentially non-irritating after 4 hours of semi-occlusive exposure to severely irritating after 24 hours of occluded exposure. There was no evidence of skin corrosion (Shell, 1991).

Serious Eye Damage / Irritation: The effects of Jet Fuel and other Kerosine substances on the eye have been investigated in rabbits using a number of samples. None of the samples tested showed more than minimal redness and swelling, which resolved within 48 hrs (ARCO, 1992e).

Respiratory or Skin Sensitization: Tests in guinea pigs with Jet Fuel and a number of other Kerosine substances showed no evidence of skin sensitization (ARCO, 1992d). There are no reports available to indicate that Jet Fuel or other Kerosine substances have the potential to cause respiratory sensitization.

Germ Cell Mutagenicity: The mutagenic potential of Jet Fuel and other Kerosine substances has been extensively studied in a range of *in vivo* and *in vitro* assays. Because most of the experimental studies were negative and the data on various individual components of kerosines and jet fuels were negative, the weight of evidence from *in vitro* and *in vivo* mutagenic studies indicates that kerosine and jet fuels are likely not mutagens (Concawe, 1991; API, 1977; API, 1984; API, 1973; API, 1980; API 1985; API, 1988).

Carcinogenicity: Kerosine is not carcinogenic when animals are exposed via the oral or inhalation route. However, chronic skin contact with kerosines and jet fuel may lead to tumour formation as a consequence of repeated cycles of irritation, skin damage and repair. Jet fuels and kerosines were not found to be mutagenic or genotoxic, and the observations from animal studies confirm the non-genotoxic nature of the skin tumour formation. Although dermal irritation alone seems not sufficient to cause dermal tumourigenicity, studies clearly show that dermal irritation and inflammation are prerequisites for dermal carcinogenicity. In studies where dermal irritation and/or inflammation were prevented but other factors, such as dermal uptake of polycyclic aromatic compounds were kept identical, no skin tumours were observed. Based on this data, kerosines are classified as non-carcinogenic (EBSI, 1996; Freeman JJ *et al*, 1993; Clark CR *et al*, 1988; API, 1989a; API, 1989b; NTP, 1986; Blackburn GR *et al*, 1986; Concawe, 1996).⁷

Some Kerosines may require classification for carcinogenicity based on the content of cumene they contain. Where cumene is present at 0.1 wt% or more as a constituent in kerosines, the substances are classified as Carc. 1B H350.

⁷ The 18th ATP upgrades the harmonised classification of cumene as Carcinogenic 1B by 1st December 2023. The impact on Concawe kerosine and naphtha dossiers has been assessed, and the Concawe classification recommendations are included in the report, as the revised dossiers have been released.

Reproductive Toxicity: Results of guideline developmental toxicity studies on Jet Fuel and other Kerosine substances and OECD developmental toxicity screening studies with Kerosine substances showed no evidence of developmental toxicity in rats. Similarly, studies in rats with Jet Fuel and other Kerosine substances did not show any effect on reproductive performance (Schreiner C *et al*, 1997; Mattie DR *et al*, 2000; Cooper JR and Mattie DR, 1996; API, 1979).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of target organ toxicity (ARCO, 1992c; API, 1987; ARCO, 1992b). Human experience indicates that exposure to high concentrations of Kerosine substances or similar substances in some situations may cause drowsiness and/or dizziness (e.g. ATSDR, 1998).

Repeated Exposure: A number of subacute and subchronic studies with kerosines and jet fuels are available. The repeated inhalation and oral studies of kerosine in rats produced no consistent toxicological effects other than changes in male rat kidneys that are not considered relevant to humans. In dermal studies, no systemic toxicity has been seen; the only effect observed was moderate to severe dermal irritation (API, 1986; Mattie DR *et al*, 1991; Mattie DR *et al*, 2000; ARCO, 1992a; Battelle, 1997).

Aspiration: Jet Fuel and other Kerosine substances are low viscosity mobile hydrocarbon liquids with a viscosity of < 20.5 mm²/s at 40 °C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of Kerosine substances show values greater than 1 mg/l and in the range 1-20 mg/l. These tests were carried out on water accommodated fractions, and in closed systems to prevent evaporative loss (Toy and Gray, 1994; EBSI, 1995; Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: A chronic toxicity study on *Daphnia magna* exposed to a Kerosine substance using WAF methodology gave a NOEL value of 0.48 mg/l based on reproduction (EMBSI, 2010).

Environmental fate (biodegradation / bioaccumulation): Kerosine substances are hydrocarbon UVCBs. Standard tests for biodegradation / bioaccumulation are intended for single substances and are not appropriate for complex substances. Based on compositional information available and measured or predicted data on key constituents, Jet Fuel and other Kerosine substances are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Kerosine substances show measured or predicted values for log K_{ow} greater than 4 and are considered potentially bio-accumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Where the substance is sold to the general public (Consumers) for use in grill lighters or lamp oils, then container labels should be visibly, legibly and indelibly marked as follows, in accordance with REACH Annex XVII:

Lamp oils

- Keep lamps filled with this liquid out of the reach of children.
- Just a sip of lamp oil - or even sucking the wick of lamps may lead to life-threatening lung damage.
- Grill lighter fluids
- Just a sip of grill lighter may lead to life-threatening lung damage.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1973) Mutagenicity study of thirteen petroleum fractions - report no. 4. Study conducted by Hine Laboratories Inc. API Health Environ. Sci. Dep. Rep. 26-60098. Washington DC: American Petroleum Institute

API (1977) Mutagenicity evaluation of kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 26-60017. Washington DC: American Petroleum Institute

API (1979) Teratology study in rats - kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 27-32175. Washington DC: American Petroleum Institute

API (1980) Mutagenicity evaluation of jet fuel A in the mouse dominant lethal assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 28-31345. Washington DC: American Petroleum Institute

API (1984) Mutagenicity evaluation studies in the rat bone marrow cytogenetic assay, in the mouse lymphoma forward mutation assay. API 81-07 hydrodesulfurized kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 32-30240. Washington DC: American Petroleum Institute

API (1985) The acute in-vivo cytogenetics assay in male and female rats of API 83-09 straight-run kerosine (CAS 8008-20-6). Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-31769. Washington DC: American Petroleum Institute

API (1986) Four week subchronic inhalation toxicity study in rats with API 81-07 hydrodesulfurized kerosine (petroleum) (CAS 64742-81-0), API 81-09 hydrodesulfurized middle distillate (petroleum) (CAS 64742-80-9), API 81-10 hydrodesulfurized middle distillate (petroleum) (CAS 64742-80-9). Study conducted by International Research and Development Corp. API Health Environ. Sci. Dep. Rep. 33-32724. Washington DC: American Petroleum Institute

API (1987) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-09 straight-run kerosine (CAS 8008-20-6). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 34-30634. Washington DC: American Petroleum Institute

API (1988) In vivo sister chromatid exchange assay with API 81-07 hydrodesulfurized kerosine. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 36-30043. Washington DC: American Petroleum Institute

API (1989a) Lifetime dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C3H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-31364. Washington DC: American Petroleum Institute

API (1989b) Twenty-four month dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C3H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-33220. Washington DC: American Petroleum Institute

ARCO (1992a) 28-day dermal toxicity study in rats administered test article F-133 thermocracked kerosene. UBTL Study No. 65895. Los Angeles CA: ARCO

ARCO (1992b) Acute dermal toxicity study in rabbits administered test article F-133 thermocracked kerosene. UBTL Study No. 65986. Los Angeles CA: ARCO

ARCO (1992c) Acute oral toxicity study in rats administered test article F-133 thermocracked kerosene. UBTL Study No. 65978. Los Angeles CA: ARCO

ARCO (1992d) Dermal sensitization study in guinea pigs administered test article F-133 thermocracked kerosene. UBTL Study No. 66010. Los Angeles CA: ARCO

ARCO (1992e) Primary eye irritation study in rabbits administered test article F-133 thermocracked kerosene. UBTL Study No. 65994. Los Angeles CA: ARCO

ATSDR (1998) Toxicological profile for jet fuels (JP-5 and JP-8). Study conducted by Research Triangle Institute. NTIS Report No. PB 99-102550. Atlanta GA: Agency for Toxic Substances and Disease Registry

Battelle (1997) 13-week subchronic dermal study with neurotoxicology evaluations of hydrodesulfurized kerosine in Sprague-Dawley rats. Study conducted by Battelle. Study No. N001450A. Washington DC: Petroleum Product Stewardship Council

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified Salmonella mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Clark, C.R. *et al* (1988) Comparative dermal carcinogenesis of shale and petroleum-derived distillates. *Toxicol Ind Health* 4, 1, 11-22

Concawe (1991) Middle distillates - a review of the results of a Concawe programme of short-term biological studies. Report No. 91/51. Brussels: Concawe

Concawe (1996) Overview of the Concawe middle distillate programme. Report No. 96/62. Brussels: Concawe

Cooper, J.R. and Mattie, D.R. (1996) Developmental toxicity of JP-8 jet fuel in the rat. *J Appl Toxicol* 16, 3, 197-200

EBSI (1995) Daphnia, acute toxicity test. Test substance MRD-94-885. Study No. 188542. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1996) Two year dermal carcinogenicity study of middle distillates in mice Report No. 117811A. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2010) Daphnia magna, reproduction test on kerosene. Report No. 10TP2. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Freeman, J.J. *et al* (1993) Evaluation of the contribution of chronic skin irritation and selected compositional parameters to the tumorigenicity of petroleum middle distillates in mouse skin. *Toxicology* 81, 103-112

Mattie, D.R. *et al* (1991) A 90-day continuous vapor inhalation toxicity study of JP-8 jet fuel followed by 20 or 21 months of recovery in Fischer 344 rats and C57BL/6 mice. *Toxicologic Pathology* 19, 2, 77-87

Mattie, D.R. *et al* (2000) Reproductive effects of JP-8 jet fuel on male and female Sprague-Dawley rats after exposure by oral gavage. Study conducted by ManTech-Geo Centers Joint Venture. Report No. AFRL-HE-WP-TR-2000-0067. Wright Patterson Air Force Base OH: US Air Force Research Laboratory

NTP (1986) Toxicology and carcinogenesis studies of marine diesel fuel and JP-5 navy fuel (CAS No. 8008-20-6) in B6C3F1 mice (dermal studies). NTP Technical Report No. 310. Research Triangle Park NC: National Toxicology Program

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Schreiner, C. *et al* (1997) Toxicity evaluation of petroleum blending streams: reproductive and developmental effects of hydrodesulfurized kerosine. *J Toxicol Environ Health* 52, 211-229

Shell (1991) Toxicology of petroleum products: the skin irritancy of odourless kerosine (white spirit). Report No. SBER.91.001. Sittingbourne: Shell Research Ltd

Toy, R. and Gray, A. (1994) SHELLSOL AD: acute toxicity of aqueous extracts to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. SBGR.93.175. Sittingbourne: Shell Research Ltd

8.4. MK1 DIESEL FUEL (MK1)

Definition / Domain: MK1 is a light petroleum distillate derived from crude petroleum, manufactured by treatment of a petroleum fraction with hydrogen in the presence of a catalyst. Given the similarity in carbon number distribution and distillation temperature range to kerosine, MK1 is often described as a kerosine rather than a gas oil. MK1 properties are defined by the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from crude petroleum
- Refinery processes:
 - atmospheric distillation
 - catalytic cracking
 - thermal cracking
 - hydrocracking
 - hydrotreatment / hydrodesulphurisation
 - catalytic reforming
 - coking
- Hydrocarbon types: Branched and straight chain paraffins and cycloparaffins
- Typical boiling point range: approximately 180°C to 295°C
- Typical carbon number range: predominantly C₁₀ to C₁₈

As shown in **Appendix 1**, MK1 is defined by a single list number (931-250-7).

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - MK1 is a liquid.

Flammable Aerosol: Not relevant - MK1 is not in aerosol form.

Flammable Liquid: MK1 is a liquid of variable flash point / initial boiling points. Flash point is ≈ 67°C and initial boiling point ≈ 180°C.

Flammable Solid: Not relevant - MK1 is a liquid.

Oxidising Gas: Not relevant - MK1 is a liquid.

Oxidising Liquid: MK1 is not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - MK1 is a liquid.

Pyrophoric Liquid: MK1 does not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - MK1 is a liquid.

Self-reactive Substance: MK1 is not self-reactive. It does not undergo exothermic decomposition when heated.

Self-heating Substance: MK1 does not react exothermically.

Gas under Pressure: Not relevant - MK1 is a liquid.

Organic Peroxide: MK1 does not meet the definition of a peroxide.

Corrosive to Metal: MK1 does not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: MK1 does not react with water.

1.2 Health Hazards

For MK1 there is no specific experimental data available. Compositional and physical-chemical data show that MK1 is very similar to Kerosine substances. It is considered appropriate, therefore, to read-across from the Kerosine substances data to MK1.

Acute Toxicity: Samples of Jet Fuel and a number of other Kerosine substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (ARCO, 1992c)
Rat inhalation (vapour)	LC ₅₀ > 5.28 mg/l (API, 1987)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (ARCO, 1992b)

Skin Corrosion / Irritation: Samples of Jet Fuel and other Kerosine substances have been tested in rabbit skin irritation studies. The degree of irritancy is substance-, dose- exposure-time and methodology dependent. Based on weight of evidence kerosines are considered irritating. There was no evidence of skin corrosion (Shell, 1991).

Serious Eye Damage / Irritation: The effects of Jet Fuel and other Kerosine substances on the eye have been investigated in rabbits using a number of samples. None of the samples tested showed more than minimal redness and swelling, which resolved within 48 hrs (ARCO, 1992e).

Respiratory or Skin Sensitization: Tests in guinea pigs with Jet Fuel and a number of other Kerosine substances showed no evidence of skin sensitization (ARCO, 1992d).). There are no reports available to indicate that Jet Fuel or other Kerosine substances have the potential to cause respiratory sensitization.

Germ Cell Mutagenicity: The mutagenic potential of Jet Fuel and other Kerosine substances has been extensively studied in a range of *in vivo* and *in vitro* assays. Because most of the experimental studies were negative and the data on various individual components of kerosines and jet fuels were negative, the weight of evidence from *in vitro* and *in vivo* mutagenic studies indicates that kerosine and jet fuels are likely not mutagens. (Concawe, 1991; API, 1977; API, 1984; API, 1973; API, 1980; API, 1985; API, 1988).

Carcinogenicity: Kerosine is not carcinogenic when animals are exposed via the oral or inhalation route. However, chronic skin contact with kerosines and jet fuel may lead to tumour formation as a consequence of repeated cycles of irritation, skin damage and repair. Jet fuels and kerosines were not found to be mutagenic or genotoxic, and the observations from animal studies confirm the non-genotoxic nature of the skin tumour formation. Although dermal irritation alone seems not sufficient to cause dermal tumourigenicity, studies clearly show that dermal irritation and inflammation are prerequisites for dermal carcinogenicity. In studies where dermal irritation and/or inflammation were prevented but other factors, such as dermal uptake of polycyclic aromatic compounds were kept identical, no skin tumours were observed. Based on this data, kerosines are not classified as carcinogenic (EBSI, 1996; Freeman JJ *et al*, 1993; Clark CR *et al*, 1988; API, 1989a; API, 1989b; NTP, 1986; Blackburn GR *et al*, 1986; Concawe, 1996).⁸

Some MK-1 may require classification for carcinogenicity based on the content of cumene they contain. Where cumene is present at 0.1 wt% or more as a constituent in MK-1, the substances are classified as Carc. 1b H350.

Reproductive Toxicity: Results of guideline developmental toxicity studies on Jet Fuel and other Kerosine substances and OECD developmental toxicity screening studies with Kerosine substances

⁸ The 18th ATP upgrades the harmonised classification of cumene as Carcinogenic 1B by 1st December 2023. The impact on Concawe kerosine and naphtha dossiers has been assessed, and the Concawe classification recommendations are included in the report, as the revised dossiers have been released.

showed no evidence of developmental toxicity in rats. Similarly, studies in rats with Jet Fuel and other Kerosine substances did not show any effect on reproductive performance (Schreiner C *et al*, 1997; Mattie DR *et al*, 2000; Cooper JR and Mattie DR, 1996; API, 1979).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of target organ toxicity (ARCO, 1992a; API, 1987; ARCO, 1992g). Human experience indicates that exposure to high concentrations of Kerosine substances or similar substances in some situations may cause drowsiness and/or dizziness (e.g. ATSDR, 1998).

Repeated Exposure: A number of subacute and subchronic studies with kerosines and jet fuels are available. The repeated inhalation and oral studies of kerosine in rats produced no consistent toxicological effects other than changes in male rat kidneys that are not considered relevant to humans. In dermal studies, no systemic toxicity has been seen; the only effect observed was moderate to severe dermal irritation. (API, 1986; Mattie DR *et al*, 1991; Mattie DR *et al*, 2000; ARCO, 1992a; Battelle, 1997).

Aspiration: MK1 is a low viscosity, mobile hydrocarbon liquid with a viscosity at 40°C of < < 20.5 mm²/s.

1.3 Environmental Hazards

There are no specific experimental data available for MK1. Compositional and physical chemical data show that MK1 is very similar to Kerosine substances. It is considered appropriate, therefore, to read-across from the Kerosine substances data to MK1. Further discussion on ecological toxicity will concern Kerosine substances, and data endpoints that are waived for Kerosine substances will be waived for MK1.

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of Kerosine substances show values greater than 1 mg/l and in the range 1-20 mg/l. These tests were carried out on water accommodated fractions, and in closed systems to prevent evaporative loss (Toy R and Gray A, 1994; EBSI, 1995). Results for Kerosine substances are consistent with the predicted aquatic toxicity of MK1 based on its hydrocarbon composition (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: A chronic toxicity study on *Daphnia magna* exposed to a Kerosine substance using WAF methodology, gave a NOEL value of 0.48 mg/l based on reproduction (EMBSI, 2010). Results for Kerosine substances are consistent with the predicted aquatic toxicity of MK1 based on its hydrocarbon composition (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): MK1 is a hydrocarbon UVCB. Standard tests for biodegradation/ bioaccumulation are intended for single substances and are not appropriate for complex substances. Based on compositional information available and measured or predicted data on key constituents, Jet Fuel and other Kerosine substances are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Kerosine substances show measured or predicted values for log K_{ow} greater than 4 and are considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

There is one single C&L permutation for MK1.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Carcinogenicity	Carc. 1B	H350: May cause cancer.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1973) Mutagenicity study of thirteen petroleum fractions - report no. 4. Study conducted by Hine Laboratories Inc. API Health Environ. Sci. Dep. Rep. 26-60098. Washington DC: American Petroleum Institute

API (1977) Mutagenicity evaluation of kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 26-60017. Washington DC: American Petroleum Institute

API (1979) Teratology study in rats - kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 27-32175. Washington DC: American Petroleum Institute

API (1980) Mutagenicity evaluation of jet fuel A in the mouse dominant lethal assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 28-31345. Washington DC: American Petroleum Institute

API (1984) Mutagenicity evaluation studies in the rat bone marrow cytogenetic assay, in the mouse lymphoma forward mutation assay. API 81-07 hydrodesulfurized kerosene. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 32-30240. Washington DC: American Petroleum Institute

API (1985) The acute *in-vivo* cytogenetics assay in male and female rats of API 83-09 straight run kerosene. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-31769. Washington DC: American Petroleum Institute

API (1986) Four week subchronic inhalation toxicity study in rats with API 81-07 (CAS 64742-81-0), API 81-09 (CAS 64742-80-9), API 81-10 (CAS 64742-80-9). Study conducted by International Research and Development Corp. API Health Environ. Sci. Dep. Rep. 33-32724. Washington DC: American Petroleum Institute

API (1987) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-09 straight-run kerosine (CAS 8008-20-6). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 34-30634. Washington DC: American Petroleum Institute

API (1988) *In vivo* sister chromatid exchange assay with API 81-07 hydrodesulfurized kerosine. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 36-30043. Washington DC: American Petroleum Institute

API (1989a) Lifetime dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C₃H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-31364. Washington DC: American Petroleum Institute

API (1989b) Twenty-four month dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C₃H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-33220. Washington DC: American Petroleum Institute

ARCO (1992a) 28-day dermal toxicity study in rats administered test article F-133 thermocracked kerosene. UBTL Study No. 65895. Los Angeles CA: ARCO

ARCO (1992b) Acute dermal toxicity study in rabbits administered test article F-131 (straight run kerosene). Testing laboratory: UBTL Inc., Salt Lake City, Utah. Report no.: 65825. Owner company: ARCO, Los Angeles, California. Study number: ATX-90-0052. Report date: 1992-03-23

ARCO (1992c) Acute oral toxicity study in rats administered test article F-155 (Straight run kerosene). Testing laboratory: UBTL, Salt Lake City, Utah. Owner company: ARCO, Los Angeles, California. Study number: ATX-900209. Report date: 1992-05-20

ARCO (1992d) Dermal sensitization study in guinea pigs administered test article F-133 thermocracked kerosene. UBTL Study No. 66010. Los Angeles CA: ARCO

ARCO (1992e) Primary eye irritation study in rabbits administered test article F-133 thermocracked kerosene. UBTL Study No. 65994. Los Angeles CA: ARCO

ATSDR (1998) Toxicological profile for jet fuels (JP-5 and JP-8). Study conducted by Research Triangle Institute. NTIS Report No. PB 99-102550. Atlanta GA: Agency for Toxic Substances and Disease Registry

Battelle (1997) 13-week subchronic dermal study with neurotoxicology evaluations of hydrodesulfurized kerosine in Sprague-Dawley rats. Study conducted by Battelle. Study No. N001450A. Washington DC: Petroleum Product Stewardship Council

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Clark, C.R. *et al* (1988) Comparative dermal carcinogenesis of shale and petroleum-derived distillates. *Toxicol Ind Health* 4, 1, 11-22

Concawe (1991) Middle distillates - a review of the results of a Concawe programme of short-term biological studies. Report No. 91/51. Brussels: Concawe

Concawe (1996) Overview of the Concawe middle distillate programme. Report No. 96/62. Brussels: Concawe

Cooper, J.R. and Mattie, D.R. (1996) Developmental toxicity of JP-8 jet fuel in the rat. *J Appl Toxicol* 16, 3, 197-200

EBSI (1995) *Daphnia*, acute toxicity test. Test substance MRD-94-885. Study No. 188542. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1996) Two year dermal carcinogenicity study of middle distillates in mice Report No. 117811A. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2010) *Daphnia magna*, reproduction test on kerosene. Report No. 10TP2. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Freeman, J.J. *et al* (1993) Evaluation of the contribution of chronic skin irritation and selected compositional parameters to the tumorigenicity of petroleum middle distillates in mouse skin. *Toxicology* 81, 103-112

Mattie, D.R. *et al* (1991) A 90-day continuous vapor inhalation toxicity study of JP-8 jet fuel followed by 20 or 21 months of recovery in Fischer 344 rats and C57BL/6 mice. *Toxicologic Pathology* 19, 2, 77-87

Mattie, D.R. *et al* (2000) Reproductive effects of JP-8 jet fuel on male and female Sprague-Dawley rats after exposure by oral gavage. Study conducted by ManTech-Geo Centers Joint Venture. Report No. AFRL-HE-WP-TR-2000-0067. Wright Patterson Air Force Base OH: US Air Force Research Laboratory

NTP (1986) Toxicology and carcinogenesis studies of marine diesel fuel and JP-5 navy fuel (CAS No. 8008-20-6) in B6C3F1 mice (dermal studies). NTP Technical Report No. 310. Research Triangle Park NC: National Toxicology Program

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Schreiner, C. *et al* (1997) Toxicity evaluation of petroleum blending streams: reproductive and developmental effects of hydrodesulfurized kerosene. *J Toxicol Environ Health* 52, 211-229

Shell (1991) Toxicology of petroleum products: the skin irritancy of odourless kerosine (white spirit). Report No. SBER.91.001. Sittingbourne: Shell Research Ltd

Toy, R. and Gray, A. (1994) SHELLSOL AD: acute toxicity of aqueous extracts to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. SBGR.93.175. Sittingbourne: Shell Research Ltd

8.5. STRAIGHT-RUN GAS OILS (SRGO)

Definition / Domain: The domain of this category is established by the refining process by which the category members are produced and the boiling point and the carbon number range, as follows:

- Derived from crude petroleum
- Refinery process
 - Atmospheric distillation
- Hydrocarbon types: straight and branched alkanes and alkenes, cycloalkanes and cycloalkenes, aromatics and mixed aromatic cycloalkanes.
- Boiling point range: 150 - 471 °C
- Carbon number range: predominantly C₉ to C₂₅

Appendix 1 lists only those SRGO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - SRGO substances are liquids.

Flammable Aerosol: Not relevant - SRGO substances are liquids.

Flammable Liquid: SRGO substances are liquids of variable flash points with typical values > 56 °C.

Flammable Solid: Not relevant - SRGO substances are liquids.

Oxidising Gas: Not relevant - SRGO substances are liquids.

Oxidising Liquid: SRGO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - SRGO substances are liquids.

Pyrophoric Liquid: SRGO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - SRGO substances are liquids.

Self-reactive Substance: SRGO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: SRGO substances do not react exothermically.

Gas under Pressure: Not relevant - SRGO substances are liquids.

Organic Peroxide: SRGO substances do not meet the definition of a peroxide.

Corrosive to Metal: SRGO substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: SRGO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of SRGO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1985a)
Rat inhalation (aerosol)	LC ₅₀ (4hr) >2.53 mg/l (EBSI, 1991)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1985a)

Based on evaluation of all the acute toxicity data, Straight Run Gas Oils do not meet the criteria for classification as acute oral or dermal toxicants under the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008), because the LD₅₀ values are greater than the limits for classification defined in the legislation.

Straight Run Gas Oil aerosols are considered to meet the criteria for classification as an acute inhalation toxicant under the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008) and are classified as Acute Tox.4; H332.

Skin Corrosion / Irritation: Samples of SRGO substances have been tested in New Zealand white rabbits skin irritation studies. Data was derived from studies in which 24 hour occluded exposure was employed instead of semi-occluded conditions for 4 hours. The degree of dermal irritation was variable but they are not expected to be irritating when animals are exposed for only 4 hours (API, 1985a). Upon repeated exposure SRGO substances may cause skin dryness or cracking. Straight Run Gas Oils do not meet the criteria for classification as skin irritants according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Serious Eye Damage / Irritation: The ability of SRGO substances to elicit eye irritation in New Zealand white rabbits has been investigated. None of the samples resulted in more than temporary redness or swelling (API, 1985a). None of the samples resulted in more than temporary redness or swelling (API, 1985a). Straight run gas oils do not meet the criteria for classification as an eye irritant according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Respiratory or Skin Sensitization: No relevant information available for respiratory sensitization. For skin sensitization, SRGO substances tested in a Beuhler assay showed no evidence of skin sensitization to guinea pigs. (API, 1985a).

Germ Cell Mutagenicity: The mutagenic potential of SRGO substances has been extensively tested in both *in vivo* and *in vitro* tests. *In vitro* gene mutation assays in bacteria (modified) with straight-run gas oils were predominantly negative and *in vivo* chromosome aberration assays were negative (May, 2013; API, 1985c,d,e,f; Blackburn *et al.*, 1984; Blackburn *et al.*, 1986; Concawe, 1996; Jungen *et al.*, 1993; Nessel *et al.*, 1998, Deininger *et al.*, 1991). Based on the evidence, Straight Run Gas Oils are unlikely to be mutagenic in humans and do not meet the criteria for classification as defined in EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Furthermore, a testing proposal has been submitted for an in-vivo alkaline comet assay (OECD TG 489) which will be combined with an in vivo micronucleus test (OECD TG474), subject to approval following ECHA/MSCAs review. **Carcinogenicity:** Prolonged exposure to straight run gas oil can result in severe dermal irritation. This repeated dermal damage can result in the development of dermal tumours. In the absence of any significant dermal irritation, tumours are not observed (API, 1989; Concawe, 1996; Broddle *et al.*, 1996). Therefore, Straight Run Gas Oils do not meet the CRITERIA for classification as a carcinogen as laid down in the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Reproductive Toxicity:

Effects on fertility

No guideline or near-guideline studies were located that have examined the potential impact of SRGO substances on reproductive function. Some indication of the likely effect of a test substance on reproductive organs can be gained from the results of repeated-dose toxicity studies with members of

this category, which did not show any treatment related effects on reproductive organs or sperm parameters (ARCO, 1994a). Nevertheless, OECD 422 studies by the oral dietary route are planned on a number of substances within the category of SRGOs in order to fill data gaps and to act as range-finding for the EOGRTS (OECD 443) which is the subject of a testing proposal.

Developmental toxicity

The key dermal developmental study on rats, reported a NOAEL of 50 mg/kg body weight/day based on significant decrease in pup body weight and increase in external, visceral, and skeletal malformation following repeated dermal application of straight-run petroleum gas oil. The maternal LOAEL was 50 mg/kg/day, based on dermal effects (ARCO, 1993a). Additional data support that straight run gasoils are not developmental toxicants (ARCO, 1993a,b; ARCO, 1994a,b).

Therefore, there is currently insufficient data to classify Straight Run Gas Oils as toxic for reproduction under the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Specific Target Organ Toxicity (STOT):

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to SRGO substances (API, 1985a; API, 1987).

Repeated Exposure: The repeated dose toxicity of SRGO substances has been studied in New Zealand white rabbits through dermal exposure and in Sprague-Dawley rats by both dermal and inhalation exposure. There are no key repeated dose studies (subacute, subchronic, or chronic) for oral exposure. However, OECD 422 studies by the oral dietary route are planned on a number of substances within the SRGOs category to fill this data gap and to act as range-finding for the EOGRTS (OECD 443) which is the subject of a testing proposal.

Results from dermal exposure indicate irritation at the application site in addition to systemic effects observed at 125 mg/Kg bw/day in a read-across subchronic study (Mobil, 1989). Effects observed in a supportive 28-day dermal toxicity study with New Zealand rabbits include increased liver and spleen weights, altered bone marrow function and liver histopathology LOAEL: 2000 mg/kg bw/day for mortality, body weight, organ weights and LOAEL: 200 mg/kg bw/day for dermal effects (API, 1985b,c).

Repeated dose inhalation studies show hydrocarbon nephropathy in male/female Sprague-Dawley rats which is considered to be both sex and species specific but not relevant to humans (ORNL, 1984; Feuston et al, 1994; API, 1985a).

Based on the above, the Straight Run Gas Oils meet the criteria for classification for Specific Target Organ Toxicity (Repeated Exposure) as Category 2; H373 under the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Aspiration: As members of this category may exist as low viscosity liquids that meet the criteria for aspiration hazard, substances in this category are classified for aspiration hazard unless the viscosity at 40°C is greater than the regulatory threshold.

Therefore, SRGO substances with kinematic viscosity ≤ 20.5 mm²/sec, are classified as aspiration hazards (H304) according to the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard:

Acute aquatic toxicity studies on samples of SRGO substances are not available; however suitable read-across information from vacuum gas oils, hydrocracked gas oils and distillate fuels is available. These

studies, carried out using the WAF methodology, show acute toxicity values for fish, crustaceans and algae greater than 1 mg/l and mostly in the range of 2-100 mg/l (Girling,A and Cann,B, 1996;Shell report No 6304,1996; Redman,A.et al, 2010). Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition.

Chronic (long-term) Aquatic Hazard:

There are no chronic toxicity studies available for SRGO substances. The aquatic toxicity was estimated using the PETROTOX computer model, which combines a partitioning Model with the Target Lipid Model. The estimated freshwater fish NOEL (No Observed Effect Level) value is 0.068 mg/l based on mortality. The estimated fresh water invertebrate NOEL (No Observed Effect Level) value is 0.167mg/l based on immobility.

The Straight Run Gas Oils meet the criteria for classification as Toxic to aquatic life with long lasting effects; H411 according to the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Environmental fate (biodegradation / bioaccumulation):

SRGO substances are hydrocarbon UVCBs and tests for these endpoints are not applicable. They are characterized using quantitative structure property relationships for representative hydrocarbon structures that comprise the hydrocarbon blocks used to assess the environmental risk with the PETRORISK model.

Degradation was achieved at varying levels in the available tests. Two tests indicate that these substances are readily biodegradable, ignoring the 10 day window which is not relevant to UVCBs (Lee, 1993; Canale, 1999; Anon, 2003; Clark et al., 2003; Battersby and Bumpus, 2001). Therefore, SRGOs are considered readily biodegradable. The calculated BCF factor for constituents of SRGOs is between 3.16-71100 l/kg (BCFBAF, 2012). This range should be treated with caution as it is the full range of predicted values.

Straight Run Gas Oils' constituents have log Kow values in the range 3.9 to greater than 6 and are likely to bioaccumulate.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Liver, spleen, bone marrow	H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H332: Harmful if inhaled.

H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*) P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statements

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*).

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*).

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

Anon (2003) High production volume (HPV) chemical challenge program. Test plan Gas Oils Category (publication), American Petroleum Institute. Report no: 201-14835

API (1985a) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitisation study in guinea pigs. API 83-11 straight run middle distillate (CAS 64741-44-2). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 32-32857. Washington DC: American Petroleum Institute

API (1985b) 28-day dermal toxicity study in the rabbit of API 83-11. Straight run middle distillate (CAS 64741-44-2). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 32-32747. Washington DC: American Petroleum Institute

API (1985c) 28-day dermal toxicity study in the rabbit of API 83-09. Study conducted by Tegeris Laboratories, Inc. API Med. Res. Publ. 33-30443. Washington DC: American Petroleum Institute

API (1985d) L5178Y TK+/- mouse lymphoma mutagenesis assay of API 83-11. Study conducted by Microbiological Associates, Inc. API Med. Res. Publ. 32-31768. Washington DC: American Petroleum Institute

API (1985e) Mutagenicity evaluation of API 83-11 in the mouse lymphoma forward mutation assay. Study conducted by Litton Bionetics, Inc. API Med. Res. Publ. 32-32166. Washington DC: American Petroleum Institute

API (1985f) Acute *in vivo* cytogenetics assay in male and female rats of API 83-11. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-32408. Washington DC: American Petroleum Institute

API (1987) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-11 straight run middle distillate (CAS 64741-44-2). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 34-30635. Washington DC: American Petroleum Institute

API (1989) Twenty-four month dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C₃H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-33220. Washington DC: American Petroleum Institute

ARCO (1993a) Developmental toxicity (embryo -fetal toxicity and teratogenic potential) study of F-193 administered percutaneously to Crl:CD[®]BR VAF/Plus[®] presumed pregnant rats. Argus Study No. 1001-005. Los Angeles CA: ARCO

ARCO (1993b) Developmental toxicity (embryo -fetal toxicity and teratogenic potential) study of F-215 administered percutaneously to Crl: CD[®]BR VAF/Plus[®] presumed pregnant rats. Argus Study No. 1001-010. Los Angeles CA: ARCO

ARCO (1994a) A developmental toxicity screen in female Sprague-Dawley rats administered F-193 dermally during gestation days -7 to 20. UBTL Study No. 66353. Los Angeles CA: ARCO

ARCO (1994b) A developmental toxicity screen in female rats administered F-215 dermally during gestation days 0 to 20. UBTL Study No. 66476. Los Angeles CA: ARCO

Battersby, N.S. and Bumpus, R.N. (2001) Research note: SMDS as an AGO component: an assessment of "ready" biodegradability. (other company data), Shell Global Solutions. Testing laboratory: Shell Global Solutions, Report no: OP.00.49011. Owner company; Shell Global Solutions, Study number: SHLL 6681, Report date: Jan 1, 2001

BCFBAF (2012): BCFBAF v3.01 (Computer model). Based on Meylan, W.M. et al. (1999): Improved Method for Estimating Bioconcentration / Bioaccumulation Factor from Octanol/Water Partition Coefficient. *Environ. Toxicol. Chem.* 18(4): 664-672 (1999)

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, p67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Broddle, W.D., et al. (1996) Chronic dermal studies of petroleum streams in mice (publication), *Fundamental and Applied Toxicology* 30:47-54. Testing laboratory: Biology Department, Montana State University-Billings, 1500 North 30th Street, Billings, Montana 59101, Owner company; Conoco, Inc., 600 North Dairy Ashford Road, Houston, Texas, 77079

Canale, A.J. (1999) Determination of the aerobic ready biodegradability of Nigerian diesel fuel using the OECD301F manometric respirometry test method. (study report), Testing laboratory: Ecotoxicology Laboratory, Mobil Business Resources Corp, Paulsboro, Owner company; MRCTEC, Extracts and Process Oils, Paulsboro, NJ., Study number: 68246, Report date: Dec 15, 1999

Clark, R *et al* (2003) The Environmental Benefits of Shell GTL Diesel (publication), *Proceedings of the 4th Int. Colloquium, "Fuels,"* Tech. Akad. Esslingen, Ostfildern, Germany, Jan 15 - 16. Testing laboratory: Shell Global Solutions, Owner company; Shell Global Solutions, Study number: OGTP.02.42152, Report date: Jan 15, 2003

Concawe (1996) Overview of the Concawe middle distillate programme. Report No. 96/62. Brussels: Concawe

Deininger, G. *et al* (1991) Middle distillates: analytical investigations and mutagenicity studies. Report No. 412-1. Hamburg: DGMK

EBSI (1991) Acute inhalation toxicity study in rats. Study performed for The Canadian Petroleum Products Institute. EBSI Study No. 196016. East Millstone NJ: Exxon Biomedical Sciences Inc.

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 and as further amended

Feuston, M.H. et al (1994) Correlation of systemic and developmental toxicities with chemical component classes of refinery streams. *Fund Applied Toxicol* 22, 622-630

Girling, A.E. and Cann, B.J. (1996a) Gasoil sample 1: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40017. Thornton: Shell Research Ltd.

Girling, A.E. and Cann, B.J. (1996b) Gasoil sample 2: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40018. Thornton: Shell Research Ltd.

Jungen, H. et al (1993) Middle distillates: dermal initiation/promotion study. Report No. 412-2. Hamburg: DGMK.

Lee, C. (1993) Water insoluble biodegradation test report. Method development using Concawe reference gas oil: Phase III. East Millstone NJ: Exxon Biomedical Sciences Inc.

May, K. (2013) 14 gas oils: bacterial reverse mutation test (ASTM E 1687). Study conducted for Concawe. Report No. PIM0002. Cambridgeshire: Huntingdon Life Sciences

Mobil (1989) Thirteen-week dermal administration of vacuum tower overheads to rats (CAS 64741-49-7). Mobil Environ. and Health Sci. Lab. Study No. 62326. Princeton NJ: Mobil Oil Corporation

Nessel, C.S. et al (1998) A comprehensive evaluation of the mechanism of skin tumorigenesis by straight-run and cracked petroleum middle distillates. *Toxicol Sci* 44, 1, 22-31

ORNL (1984) Inhalation toxicology of diesel fuel obscurant aerosol in Sprague-Dawley rats. Phase 3: subchronic exposures. Report No. TM-9403. Oak Ridge TN: Oak Ridge National Laboratory

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

8.6. CRACKED GAS OILS (CRACKEDGO)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced and the boiling point and the carbon number range as follows:

- Derived from crude petroleum
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - catalytic cracking
 - thermal cracking
- Hydrocarbon types: aromatics, alkylated aromatics, mixed aromatic cycloalkanes, straight and branched alkanes and alkenes, cycloalkanes and cycloalkenes.
- Boiling point range: 150 - 450 °C
- Carbon number range: predominantly C₉ to C₃₀

Appendix 1 lists only those CrackedGO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - CrackedGO substances are liquids.

Flammable Aerosol: Not relevant - CrackedGO substances are liquids.

Flammable Liquid: CrackedGO substances are liquids of variable flash points typically > 56°C. For liquids, only flash point data are required to characterise flammability.

Flammable Solid: Not relevant - CrackedGO substances are liquids.

Oxidising Gas: Not relevant - CrackedGO substances are liquids.

Oxidising Liquid: CrackedGO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - CrackedGO substances are liquids.

Pyrophoric Liquid: CrackedGO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - CrackedGO substances are liquids.

Self-reactive Substance: CrackedGO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: CrackedGO substances do not react exothermically.

Gas under Pressure: Not relevant - CrackedGO substances are liquids.

Organic Peroxide: CrackedGO substances do not meet the definition of a peroxide.

Corrosive to Metal: CrackedGO substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: CrackedGO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of CrackedGO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 4600 mg/kg _{bw} (male), 3200 mg/kg _{bw} (female)(API, 1985a)
Rat inhalation (aerosol)	LC ₅₀ ≥ 4.65 mg/l (API, 1986)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1985a)

Skin Corrosion / Irritation: Samples of CrackedGO substances were tested in rabbit skin irritation studies. Results obtained indicate that exposure to CrackedGO substances results in skin irritation. There was no evidence of skin corrosion (EBSI, 1996a).

Serious Eye Damage / Irritation: The ability of CrackedGO substances to elicit eye irritation in rabbits has been investigated. None of the samples were irritating to the eye (API, 1985c).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. For skin sensitization CrackedGO substances were tested and showed no evidence of skin sensitization (API, 1985c).

Germ Cell Mutagenicity: The mutagenic potential of CrackedGO substances has been extensively tested in both *in vivo* and *in vitro* tests. The results of the studies were ambiguous *in vitro* and showed no evidence of *in vivo* mutagenic activity (Deininger *et al*, 1991; API, 1985b). Based on the available data, CrackedGO substances are not considered to be germ cell mutagens.

Carcinogenicity: Repeated dermal application of CrackedGO substances to animals resulted in tumour formation. Based on data from the experiments conducted with CrackedGO substances they are considered to be carcinogens (EBSI, 1996b).

Reproductive Toxicity: No guideline or near-guideline studies were located that have examined the potential impact of CrackedGO substances on fertility, however gonadal histopathology and/or sperm parameters (counts; morphology) were among endpoints routinely included in sub-chronic dermal evaluations of some CrackedGO substances. There was evidence of developmental effects in animals but these were considered minor and were observed in the presence of maternal toxicity which is a confounding factor in determining toxicity (ARCO, 1994a; ARCO, 1994b; Mobil, 1990; ARCO, 1994c; Mobil, 1994; ARCO, 1993; Mobil, 1989; Mobil, 1987). Based on the available data CrackedGO substances are not considered to be developmental toxicants.

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to CrackedGO substances (API, 1985c; API, 1986).

Repeated Exposure: The repeat dose toxicity of CrackedGO substances has been studied. Target organ toxicity has been observed in blood, thymus, and liver (ORNL, 1984; Cruzan, 1985; Mobil, 1990; API, 1985d). In a 90 day repeat dose dermal study, the NOEL was 25 mg/kg/day, with a LOEL of 125 mg/kg/day (Mobil, 1985). In another study the LOAEL is identified as 30 mg/kg/day (Mobil, 1991). Based on these data cracked gas oils are classified for repeat dose toxicity as STOT (repeated exposure) Cat 2, H373 according to EU CLP Regulation (EU, 2008) criteria.

Aspiration: CrackedGO substances span a range of viscosities with values reported as 1.1 - 4.5 mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of CrackedGO substances show LL50 values ranging from 0.22 mg/l for crustaceans to 8.82 mg/l for algae (EMBSI, 2011a-d; EMBSI, 2012a-d; EMBSI, 2012f-h; Redman and Yadav, 2010; Hydroqual, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity: Chronic aquatic toxicity studies on samples of CrackedGO substances show NOELR vales ranging from 0.05 mg/l for crustaceans and algae to 0.93 mg/l for algae (EMBSI, 2012e-h). Aquatic toxicity data for fish, Daphnia and algae are in range <1 mg/L for some Cracked Gas Oils. Some Cracked Gas Oils may not meet criteria for ready degradability and components have log K_{ow} values in the range 3.9 to greater than 6. Therefore Cracked Gas oils are classified as Aquatic Acute Toxicity 1 (H400: Very toxic to aquatic life) and Aquatic Chronic Toxicity 1 (H410: Very toxic to aquatic life with long lasting effects).

Environmental fate (biodegradation / bioaccumulation): CrackedGO substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable but are inherently biodegradable. Components of cracked gas oils are likely to bio-accumulate (log $K_{ow} \geq 4$).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H350: May cause cancer.

H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable condition.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1985a). Acute oral toxicity study in rats; acute dermal toxicity study in rabbits; primary dermal irritation study in rabbits; primary eye irritation study in rabbits; dermal sensitization study in guinea pigs; API 83-07 light catalytically cracked distillate. Wisconsin. Report no.: 33-30162. Owner company: American Petroleum Institute, Washington DC

API (1985b) Acute *in vivo* cytogenetics assay in male and female rats of API 83-11. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-32408. Washington DC: American Petroleum Institute

API (1985c) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-08 light catalytically reformed distillate (CAS 64741-59-9). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 32-32859. Washington DC: American Petroleum Institute

API (1985d) 28-day dermal toxicity study in the rabbit of API 83-07. Light catalytically cracked distillate (CAS 64741-59-9). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 32-32751. Washington DC: American Petroleum Institute

API (1986) Acute inhalation toxicity evaluation in rats. API 83-08 light catalytically cracked distillate (CAS 64741-59-9). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 33-30444. Washington DC: American Petroleum Institute

ARCO (1993) Dose-range developmental toxicity (embryo-fetal toxicity and teratogenic potential) study of F-199 administered percutaneously to Crl:CD®BR VAF/Plus® rats. Study conducted by Argus Research Laboratories Inc. Los Angeles CA: ARCO

ARCO (1994a) A developmental toxicity screen in female rats administered F-277 dermally during gestation days -7 to 20 (CAS 64741-82-8). UBTL Study No. 67008. Los Angeles CA: ARCO

ARCO (1994b) A developmental toxicity screen in female Sprague-Dawley rats administered F-199 dermally during gestation days -7 to 20 (CAS 64741-82-8). UBTL Study No. 66359. Los Angeles CA: ARCO

ARCO (1994c) A developmental toxicity screen in female rats administered F-213 dermally during gestation days 0 to 20 (CAS 64741-59-9). UBTL Study No. 66475. Los Angeles CA: ARCO

Cruzan, G. (1985) Thirteen week dermal administration of light cycle oil to rats (CAS 64741-59-9). Mobil Environ. and Health Sci. Lab. Study No. 20535. Princeton NJ: Mobil Oil Corporation

Deininger, G. *et al* (1991) Middle distillates: analytical investigations and mutagenicity studies. Report No. 412-1. Hamburg: DGMK

EBSI (1996a). Primary dermal irritation study in the rabbit. Study performed for Concawe. EBSI Study No. 117904A. East Millstone NJ: Exxon Biomedical Sciences, Inc.

EBSI (1996b) Two year dermal carcinogenicity study of middle distillates in mice. Report No. 117811A. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2011a) *Oncorhynchus mykiss*, fish acute toxicity test on water accommodated fractions of a light catalytic cracked gas oil. Study performed for API. EMBSI Study No. 1057658. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2011b) *Daphnia magna*, acute immobilisation test on water accommodated fractions of a light catalytic cracked gas oil. Study performed for API. EMBSI Study No. 1057642. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2011c) Alga, growth inhibition test on light cracked gas oil. Study performed for Concawe. EMBSI Study No. 1057867. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2011d) Alga, growth inhibition test on water accommodated fractions of a light catalytic cracked gas oil. Study performed for API. EMBSI Study No. 1057667. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012a) *Daphnia sp.*, acute immobilisation test. Study performed for Concawe. EMBSI Study No. 1057942. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012b) *Daphnia sp.*, acute immobilisation test. Study performed for Concawe. EMBSI Study No. 1059542. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012c) *Daphnia sp.*, acute immobilisation test. Study performed for Concawe. EMBSI Study No. 1057842. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012d) *Daphnia sp.*, acute immobilisation test. Study performed for Concawe. EMBSI Study No. 1060442. Annandale, NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012e) *Daphnia magna*, reproduction test on water accommodated fractions of a light catalytic cracked gas oil. Study performed for API. EMBSI Study No. 1057646. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012f) Alga, growth inhibition test on heavy cracked diesel oil. Study performed for Concawe. EMBSI Study No. 1057967. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012g) Alga, growth inhibition test on light cracked gas oil. Study performed for Concawe. EMBSI Study No. 1059567. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012h) Alga, growth inhibition test on thermally cracked gas oil. Study performed for Concawe. EMBSI Study No. 1060467. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 and as further amended

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

Mobil (1985): Thirteen week dermal administration of light cycle oil to rats. (study report), Testing laboratory: Mobil Environmental and Health Science Laboratory, Princeton, NJ, Report no: 20535. Owner company; Mobil, Study number: 20535, Report date: Jul 3, 1985

Mobil (1987) Light cycle oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 50511. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to Coker light gas oil (CLGO). Mobil Environ. and Health Sci. Lab. Study No. 61998. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week dermal administration of Beaumont Coker light gas oil to rats (CAS 64741-82-8). Mobil Environ. and Health Sci. Lab. Study No. 61996. Princeton NJ: Mobil Oil Corporation

Mobil (1991): Thirteen-week dermal administration of beaumont coker light gas oil to rats (study report), Testing laboratory: Environmental and Health Sciences Laboratory, Princeton, New Jersey, Report no: 61996. Owner company; Concawe

Mobil (1994) Teratogenicity study in rats exposed orally to a single dose of a refinery stream. Mobil Environ. and Health Sci. Lab. Study No. 65371. Princeton NJ: Mobil Oil Corporation

ORNL (1984) Inhalation toxicology of diesel fuel obscurant aerosol in Sprague-Dawley rats. Phase 3: subchronic exposures. Report No. TM-9403. Oak Ridge TN: Oak Ridge National Laboratory

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

8.7. VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS (VHGO)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced and the boiling point and the carbon number range as follows:

- Derived from crude petroleum
- Refinery processes
 - Atmospheric distillation
 - Vacuum distillation
 - Hydrocracking
 - Blending of petroleum substances to produce the following CAS RNs
 - 68334-30-5 Fuels, Diesel
 - 68476-30-2 Fuel Oil No. 2
 - 68476-31-3 Fuel Oil No 4
 - 68476-34-6 Fuels Diesel No 2
- Hydrocarbon types: straight and branched alkanes and alkenes, cycloalkanes and cycloalkenes, aromatics and mixed aromatic cycloalkanes.
- Boiling point range: 160 500 °C
- Carbon number range: predominantly C₉ to C₃₀

Appendix 1 lists only those VHGO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - VHGO substances are liquids.

Flammable Aerosol: Not relevant - VHGO substances are liquids.

Flammable Liquid: VHGO substances are liquids of variable flash points with values > 56°C. For liquids, only flash point data are required to characterise flammability.

Flammable Solid: Not relevant - VHGO substances are liquids.

Oxidising Gas: Not relevant - VHGO substances are liquids.

Oxidising Liquid: VHGO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - VHGO substances are liquids.

Pyrophoric Liquid: VHGO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - VHGO substances are liquids.

Self-reactive Substance: VHGO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: VHGO substances do not react exothermically.

Gas under Pressure: Not relevant - VHGO substances are liquids.

Organic Peroxide: VHGO substances do not meet the definition of a peroxide.

Corrosive to Metal: VHGO substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: VHGO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of VHGO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000mg/kg _{bw} (API, 1980a, b)
Rat inhalation	LC ₅₀ ≥ 4.1 mg/l (ARCO, 1988)
Rabbit dermal	LD ₅₀ > 5 ml/kg _{bw} (approx. 4300 mg/kg _{bw}) (API, 1980a, b)

Skin Corrosion / Irritation: Samples of VHGO substances were tested in rabbit skin irritation studies (24 hour occluded). These data indicate that exposure to VHGO substances can cause skin irritation (API, 1980a; API, 1980b). There was no evidence of skin corrosion.

Serious Eye Damage / Irritation: The ability of VHGO substances to elicit eye irritation in rabbits has been investigated. None of the samples were irritating to the eye (API, 1980a; API, 1980b).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. For skin sensitization VHGO samples were tested and showed no evidence of skin sensitization (API, 1980a; API, 1980b).

Germ Cell Mutagenicity: The mutagenic potential of VHGO substances have been extensively tested in both *in vivo* and *in vitro* tests. The *in vitro* results were ambiguous while the *in vivo* studies showed a lack of mutagenic activity. Based on the data available VHGO substances are not considered to be germ cell mutagens (Deininger *et al*, 1991; McKee *et al*, 1994; API, 1985).

Carcinogenicity: Samples of VHGO substances show variable activity in skin painting bioassays. Skin irritation has been shown to contribute to the development of tumours. Based on the data available VHGO substances are considered as potentially carcinogenic (Biles *et al*, 1988).

Reproductive Toxicity: No guideline or near-guideline studies were located that have examined the potential impact of VHGO substances on reproductive function, however gonadal histopathology and/or sperm parameters (counts; morphology) were among endpoints routinely included in sub-chronic dermal evaluations of some VHGO substances. The data indicate these substances are not reproductive toxicants (Mobil, 1989a; API, 1979a; API, 1979b). Nevertheless, a testing proposal for reproductive toxicity has been included in the registration dossiers submitted to ECHA.

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to VHGO substances (API, 1980a; API, 1980b; ARCO, 1988).

Repeated Exposure: The repeat dose toxicity of VHGO substances has been tested. Following 13 week dermal exposure in Sprague-Dawley rats, thymus, liver, and bone marrow changes were noted in a dose dependent manner (ARCO, 1992; Mobil, 1989b; ORNL, 1984).

Aspiration: VHGO substances span a range of viscosities with values reported as ≥1.5 mm²/s at 40° C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of VHGO substances, carried out using the WAF methodology, report acute toxicity values for fish, crustaceans and algae

greater than 1 mg/l and mostly in the range of 2-100 mg/l (Girling. and Cann, 1996a,b; Redman and Yadav, 2010). The lowest LL50 was 2 mg/l for *Daphnia magna* (Febbo E, 2007).

Chronic (long-term) Aquatic Hazard: Aquatic toxicity data for fish, *Daphnia* and algae are in range 1-100 mg/l. Gas oils components have log K_{ow} values in the range 3.9 to greater than 6. Therefore Vacuum Gas oils would be classified as H411 under the EU CLP Regulation (EC) No 1272/2008 (EU, 2008).

Environmental fate (biodegradation / bioaccumulation): VHGO substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, VHGO substances are not predicted to be readily biodegradable but they are inherently biodegradable (The Petroleum HPV Testing Group, 2003; Mobil, 1999; Lee, 1993). Hydrocarbon constituents of VHGO substances are predicted to bio-accumulate (log K_{ow} values above 4.0).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations).

Although Part 3 of Annex VI of CLP includes Note N

("The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.") for the VHGO substance with EC 269-822-7, this Note is not applied in any of the C&L permutations and, therefore, all VHGO substances are classified as Carcinogenic Cat. 2.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Thymus, liver, bone marrow	H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1979a) Inhalation/teratology study in rats - fuel oil. Study conducted by Litton Bionetics Inc. API Health Environ. Sci. Dep. Rep. 27-30483. Washington DC: American Petroleum Institute

API (1979b) Teratology study in rats - diesel fuel. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 27-32174. Washington DC: American Petroleum Institute

API (1980a) Acute toxicity tests API #78-4 #2 home heating oil (50% cat). Study conducted by Elars Bioresearch Laboratories Inc. API Health Environ. Sci. Dep. Rep. 27-32068. Washington DC: American Petroleum Institute

API (1980b) Acute toxicity tests API #79-6 diesel fuel (marketplace sample). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 27-32817. Washington DC: American Petroleum Institute

API (1985) Acute *in vivo* cytogenetics assay in male and female rats of API 83-11. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-32408. Washington DC: American Petroleum Institute

ARCO (1988) Acute inhalation toxicity study in rats administered F-72-01 naval distillate. Study conducted by Bio/dynamics Inc. Study No. 85-7867A. Los Angeles CA: ARCO

ARCO (1992) 28-day dermal toxicity study in rats - F-102-01 naval distillate. UBTL Study No. 65365. Los Angeles CA: ARCO

Biles, R.W. *et al* (1988) Dermal carcinogenic activity of petroleum-derived middle distillate fuels. *Toxicology* 53, 301-314

Deininger, G. *et al* (1991) Middle distillates: analytical investigations and mutagenicity studies. Report No. 412-1. Hamburg: DGMK

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 and as further amended

Febbo, E (2007) Fish, acute toxicity test with fathead minnows. Owner company: ExxonMobil Chemicals, Intermediates. Laboratory report 142940FHM. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Girling, A.E. and Cann, B.J. (1996a) Gasoil sample 1: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40017. Thornton: Shell Research Ltd

Girling, A.E. and Cann, B.J. (1996b) Gasoil sample 2: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40018. Thornton: Shell Research Ltd

Lee, C. (1993) Water insoluble biodegradation test report. Method development using Concawe reference gas oil: Phase III. East Millstone NJ: Exxon Biomedical Sciences Inc.

McKee, R.H. *et al* (1994) Evaluation of the genetic toxicity of middle distillate fuels. *Environmental and Molecular Mutagenesis* 23, 234-238

Mobil (1989a) Developmental toxicity study in rats exposed dermally to vacuum tower overheads (VTO) (CAS 64741-49-7). Mobil Environ. and Health Sci. Lab. Study No. 62328. Princeton NJ: Mobil Oil Corporation

Mobil (1989b) Thirteen-week dermal administration of vacuum tower overheads to rats (CAS 64741-49-7). Mobil Environ. and Health Sci. Lab. Study No. 62326. Princeton NJ: Mobil Oil Corporation

Mobil (1999) Determination of the aerobic ready biodegradability of Nigerian diesel fuel using the OECD 301F manometric respirometry test method. Study conducted by Ecotoxicology Laboratory. Mobil Business Resources Corp. Study No. 68246. Paulsboro NJ: Mobil Business Resources Corp.

ORNL (1984) Inhalation toxicology of diesel fuel obscurant aerosol in Sprague-Dawley rats. Phase 3: subchronic exposures. Report No. TM-9403. Oak Ridge TN: Oak Ridge National Laboratory

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

The Petroleum HPV Testing Group (2003) High production volume (HPV) chemical challenge program. Test plan gas oils category. HPV Consortium No. 1100997. Administered by API. Washington DC: American Petroleum Institute

8.8. OTHER GAS OILS (OTHERGO)

Definition / Domain: The domain of this category is established by the refining process by which the category members are produced and the boiling point and the carbon number range as follows:

- Derived from crude petroleum
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - hydrotreating
- Hydrocarbon types: aromatics, alkylated aromatics, mixed aromatic cycloalkanes, straight and branched alkanes and alkenes, cycloalkanes and cycloalkenes.
- Boiling point range: 205°C - 400°C
- Carbon number range: predominantly C₉ to C₃₆

Appendix 1 lists only those OtherGO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - OtherGO substances are liquids.

Flammable Aerosol: Not relevant - OtherGO substances are liquids.

Flammable Liquid: OtherGO substances are liquids of variable flash points with values > 56°C. For liquids, only flash point data are required to characterise flammability.

Flammable Solid: Not relevant - OtherGO substances are liquids.

Oxidising Gas: Not relevant - OtherGO substances are liquids.

Oxidising Liquid: OtherGO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - OtherGO substances are liquids.

Pyrophoric Liquid: OtherGO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - OtherGO substances are liquids.

Self-reactive Substance: OtherGO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: OtherGO substances do not react exothermically.

Gas under Pressure: Not relevant - OtherGO substances are liquids.

Organic Peroxide: OtherGO substances do not meet the definition of a peroxide.

Corrosive to Metal: OtherGO substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: OtherGO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of OtherGO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982a; API, 1982b)
Rat inhalation (aerosol)	LC ₅₀ 4,6 mg/l (API, 1983c),
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1982a; API, 1982b)

Skin Corrosion / Irritation: Samples of OtherGO substances were tested in rabbit skin irritation studies. Results obtained were from 24h occlusion tests, and indicate that exposure to OtherGO substances results in skin irritation that when extrapolated to a 4 hour exposure is expected to be irritating (API, 1982a; API, 1982b). There was no evidence of skin corrosion.

Serious Eye Damage / Irritation: The ability of OtherGO substances to elicit eye irritation in rabbits has been investigated. None of the samples resulted in lasting irritation to the eye (API, 1982a; API, 1982b).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. For skin sensitization samples were tested and showed no evidence of skin sensitization (API, 1984a; API, 1984b).

Germ Cell Mutagenicity: The mutagenic potential of OtherGO substances has been extensively tested in both *in vivo* and *in vitro* tests. The *in vitro* results were ambiguous while the *in vivo* studies showed a lack of mutagenic activity. Based on the data available, OtherGO substances are not considered to be germ cell mutagens (Deininger *et al*, 1991; API, 1985).

Carcinogenicity: Based on data available, OtherGO substances may be considered carcinogenic dependent upon refining process (EBSI, 1996; Concawe, 1996).

Reproductive Toxicity: No guideline studies were located that have examined the potential impact of OtherGO substances on reproductive function. A testing proposal for reproductive toxicity has been included in the registration dossiers submitted to ECHA.

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to OtherGO substances (API, 1982a; API, 1982b; API, 1983c; API, 1987).

Repeated Exposure: The repeat dose toxicity of OtherGO substances has been studied. Target organ toxicity has been observed in blood, thymus, and liver (API, 1986; ORNL, 1984; Mobil, 1990; Cruzan G, 1985; API, 1983a; API, 1983b). Based on a NOAEL of 25 mg/kg/day in one 90-day dermal toxicity study, and a LOAEL of 30 mg/kg/day from another 90-day dermal toxicity study, carcinogenic Other Gas Oils (see OIN 14) are classified for repeat dose toxicity as H373 according to the EU CLP Regulation ((EC) No 1272/2008) (EU, 2008).

Aspiration: OtherGO substances span a range of viscosities with values reported as 2.0 - 8.1mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of OtherGO substances are unavailable; however suitable read-across information from VHGO substances is available (Girling and Cann, 1996a,b). These studies, carried out using the WAF methodology, show acute toxicity values for fish, crustaceans and algae greater than 1 mg/l and mostly in the range of 2-100 mg/l. Results are

consistent with the predicted aquatic toxicity of OtherGO substances based on their hydrocarbon composition (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Aquatic toxicity data for fish, Daphnia and algae are in range 1-100 mg/l. Gas oils components have log K_{ow} values in the range 3.9 to greater than 6. Therefore Other Gas oils would be classified as H411 under the EU CLP criteria, (EC) No 1272/2008 (EU, 2008).

Environmental fate (biodegradation / bioaccumulation): OtherGO substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, category members are predicted to be readily biodegradable (Lee, 1993; The Petroleum HPV Testing Group, 2003; Mobil, 1999)⁹. Components of OtherGO substances are likely to bioaccumulate (log K_{ow} values ≥ 4.0).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the ‘worst-case’ C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



⁹ Further data are currently being reviewed in the registration dossier, and the outcome as “inherently biodegradable” is expected.

Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982a) Acute toxicity studies of hydrodesulfurized middle distillate. API 81-09. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-32347. Washington DC: American Petroleum Institute

API (1982b) Acute toxicity studies of hydrodesulfurized middle distillate. API 81-10. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-32348. Washington DC: American Petroleum Institute

API (1983a) 28-day dermal toxicity study in the rabbit. API 81-09 hydrodesulfurized middle distillate. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32298. Washington DC: American Petroleum Institute

API (1983b) 28-day dermal toxicity study in the rabbit. API 81-10 hydrodesulfurized middle distillate. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32296. Washington DC: American Petroleum Institute

API (1983c) LC₅₀ acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 81-09 hydrodesulfurized middle distillate. Study conducted by International Research and Development Corporation. API Med. Res. Publ. 30-32856. Washington DC: American Petroleum Institute

API (1984a) Dermal sensitization study in guinea pigs -closed patch technique. API 81-10 hydrodesulfurized middle distillate. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31414. Washington DC: American Petroleum Institute

API (1984b) Dermal sensitization study in guinea pigs -closed patch technique. API 81-09 hydrodesulfurized middle distillate. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31352. Washington DC: American Petroleum Institute

API (1985) Acute *in vivo* cytogenetics assay in male and female rats of API 83-11. Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 32-32408. Washington DC: American Petroleum Institute

API (1986) Four week subchronic inhalation toxicity study in rats with API 81-07 hydrodesulfurized kerosine (petroleum) (CAS 64742-81-0), API 81-09 hydrodesulfurized middle distillate (petroleum) (CAS 64742-80-9), API 81-10 hydrodesulfurized middle distillate (petroleum) (CAS 64742-80-9). Study conducted by International Research and Development Corp. API Health Environ. Sci. Dep. Rep. 33-32724. Washington DC: American Petroleum Institute

API (1987) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-11 straight run middle distillate (CAS 64741-44-2). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 34-30635. Washington DC: American Petroleum Institute

Concawe (1996) Overview of the Concawe middle distillate programme. Report No. 96/62. Brussels: Concawe

Cruzan, G. (1985) Thirteen week dermal administration of light cycle oil to rats (CAS 64741-59-9). Mobil Environ. and Health Sci. Lab. Study No. 20535. Princeton NJ: Mobil Oil Corporation

Deininger, G. *et al* (1991) Middle distillates: analytical investigations and mutagenicity studies. Report No. 412-1. Hamburg: DGMK

EBSI (1996) Two year dermal carcinogenicity study of middle distillates in mice. Report No. 117811A. East Millstone NJ: Exxon Biomedical Sciences Inc.

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 and as further amended

Girling, A.E. and Cann, B.J. (1996a) Gasoil sample 1: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40017. Thornton: Shell Research Ltd

Girling, A.E. and Cann, B.J. (1996b) Gasoil sample 2: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40018. Thornton: Shell Research Ltd

Lee, C. (1993) Water insoluble biodegradation test report. Method development using Concawe reference gas oil: Phase III. East Millstone NJ: Exxon Biomedical Sciences Inc

Mobil (1990) Thirteen-week dermal administration of Beaumont Coker Light Gas Oil to rats (CAS 64741-82-8). Mobil Environ. and Health Sci. Lab. Study No. 61996. Princeton NJ: Mobil Oil Corporation

Mobil (1999) Determination of the aerobic ready biodegradability of Nigerian diesel fuel using the OECD 301F manometric respirometry test method. Study conducted by Ecotoxicology Laboratory. Mobil Business Resources Corp. Study No. 68246. Paulsboro NJ: Mobil Business Resources Corp.

ORNL (1984) Inhalation toxicology of diesel fuel obscurant aerosol in Sprague-Dawley rats. Phase 3: subchronic exposures. Report No. TM-9403. Oak Ridge TN: Oak Ridge National Laboratory

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

The Petroleum HPV Testing Group (2003) High production volume (HPV) chemical challenge program. Test plan gas oils category. HPV Consortium No. 1100997. Administered by API. Washington DC: American Petroleum Institute

8.9. HEAVY FUEL OIL COMPONENTS (HFO)

Definition / Domain: The domain of this category is defined as streams obtained as either distillates or residues from distillation and cracking processes and containing saturated, aromatic and olefinic hydrocarbons, with carbon numbers $>C_8$ and boiling point range of 150 to $>750^{\circ}C$.

HFO substances are produced using various refinery distillation and cracking processes. The most common components are:

- Long residue: the residue from the atmospheric distillation of crude oil.
- Short residue: the residue from the vacuum distillation of crude oil.
- Thermal cracker or visbreaker residue: the residue from thermal cracking processes.
- Cat cracker slurry oil (clarified oil): a heavy fraction from a catalytic cracking.
- Thermally cracked or visbreaker gas oil: a middle distillate fraction from thermal cracker or visbreaker units.
- Vacuum gas oil: a heavy gas oil fraction (vacuum distillate) from the vacuum column.
- Cat cracker cycle oil: a middle distillate fraction from the catalytic cracking unit.
- Gas oil: a heavier middle distillate fraction from the atmospheric column.

Appendix 1 lists only those HFO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - HFO substances are liquids at ambient temperature.

Flammable Aerosol: Not relevant - HFO substances are not in aerosol form.

Flammable Liquid: HFO substances are liquids of variable flash point. Typical values reported are $> 60^{\circ}C$.

Flammable Solid: Not relevant - HFO substances are liquids at ambient temperature.

Oxidising Gas: Not relevant - HFO substances are liquids at ambient temperature.

Oxidising Liquid: HFO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - HFO substances are liquids at ambient temperature.

Pyrophoric Liquid: HFO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - HFO substances are liquids at ambient temperature.

Self-reactive Substance: HFO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: HFO substances do not react exothermically.

Gas under Pressure: Not relevant - HFO substances are liquids at ambient temperature.

Organic Peroxide: HFO substances do not meet the definition of a peroxide.

Corrosive to Metal: HFO substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: HFO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of HFO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ 4320 (females) mg/kg _{bw} (API, 1982)
Rat inhalation (aerosol)	LC ₅₀ 4.1 mg/l (ARCO, 1987)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1982)

Skin Corrosion / Irritation: Samples of HFO substances have been tested in rabbit skin irritation studies. The majority of the data were derived using a 24 hour occluded exposure protocol. Based on these studies HFO substances cause no more than moderate irritation. Upon repeated exposure some HFO substances may cause skin dryness or cracking. There was no evidence of skin corrosion in this these studies.(API, 1980)

Serious Eye Damage / Irritation: The effects of HFO substances on the eye have been investigated in rabbits using a number of samples. None of the samples tested showed more than transient, fully reversible eye irritation (API, 1980).

Respiratory or Skin Sensitization: Samples of HFO substances have been tested in the guinea pig using a closed patch technique (Buehler method). These data show no evidence of skin sensitization (API, 1980). There are no reports available to indicate a potential to cause respiratory sensitization.

Germ Cell Mutagenicity: The mutagenic potential of HFO substances has been extensively studied in a range of *in vivo* and *in vitro* assays. (API, 1985a; API, 1985b; API, 1986; Przygoda *et al*, 1999). In general, the *in vitro* studies showed evidence of mutagenic activity whereas *in vivo* studies showed no activity. Based on the available data, HFO substances are not considered to be germ cell mutagens.

Carcinogenicity: The carcinogenic potential of HFO substances has been investigated in animals following dermal exposure. These data indicate that HFO substances are carcinogenic (API, 1989).

Reproductive Toxicity: Results of developmental and reproductive toxicity studies on HFO substances showed evidence of developmental toxicity (Hoberman *et al*, 1995; ARCO, 1994).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1980; ARCO, 1987).

Repeated Exposure: The repeat dose toxicity of HFO substances has been investigated following dermal exposure (ARCO, 1993a; ARCO, 1993b). These data indicate a potential to cause systemic injury, with the blood, thymus and liver being key target tissues.

Aspiration: HFO substances are hydrocarbon liquids of variable viscosity. Reported values for some HFO substances are <20.5 mm²/s at 40°C, while others may be above 20.5 mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies with fish, invertebrates and algae on samples of HFO substances show variable acute toxicity, with the most sensitive species (algae) giving values less than 1 mg/l. These tests were carried out on water accommodated fractions (EMBSI, 2008a, 2008b, 2008c; Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on *Daphnia magna* exposed to samples of HFO substances show variable chronic toxicity, with a lowest NOEL value of 0.1 mg/l (EMBSI, 2012).

Environmental fate (biodegradation / bioaccumulation): HFO substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of HFO substances show measured or predicted values for log K_{ow} ranging from 4 to greater than 6 and are thus considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H332: Harmful if inhaled.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1980) Acute toxicity tests API 78-6 #6 heavy fuel oil. Primary skin irritation study in rabbits. Primary eye irritation study in rabbits. Skin sensitization study in guinea pigs. Acute dermal toxicity

study in rabbits. Acute oral toxicity study in rats. Sub-acute dermal toxicity study in rabbits. Study conducted by Elars Bioresearch Laboratories, Inc. API Med. Res. Publ. 27-32814. Washington DC: American Petroleum Institute

API (1982) Acute toxicity studies of catalytically cracked clarified oil. API 81-15. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31854. Washington DC: American Petroleum Institute

API (1985a) Mutagenicity evaluation studies in the rat bone marrow cytogenetic assay and in the mouse lymphoma forward mutation assay API 81-15 (catalytic cracked clarified oil). Study conducted by Litton Bionetics, Inc. API Med. Res. Publ. 32-30534. Washington DC: American Petroleum Institute

API (1985b) CHO/HGPRT mammalian cell forward gene mutation assay of API 81-15. Study conducted by Pharmakon Research International, Inc. API Med. Res. Publ. 32-32118. Washington DC: American Petroleum Institute

API (1986) *Salmonella*/mammalian-microsome plate incorporation mutagenicity assay (Ames test). Study conducted by Microbiological Associates Inc. API Med. Res. Publ. 33-30599. Washington DC: American Petroleum Institute

API (1989) Lifetime dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C₃H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-31364. Washington DC: American Petroleum Institute

ARCO (1987) Acute dermal toxicity study in rabbits administered F-74-01 heavy fuel oil. UBTL Study No. 60563. Los Angeles CA: ARCO

ARCO (1993a) 28-day dermal toxicity study in rats administered test article F-115-01 FCCU clarified oil. UBTL Study No. 65508. Los Angeles CA: ARCO

ARCO (1993b) Ninety (90) day dermal toxicity study in rats administered test article F-179. UBTL Study No. 66152. Los Angeles CA: ARCO

ARCO (1994) A developmental toxicity screen in female rats administered F-228 dermally during gestation days 0 to 20. UBTL Study No. 66479. Los Angeles CA: ARCO

EMBSI (2008a) Alga, growth inhibition test. MRD-07-913 heavy fuel oil #7 and MRD-07-915 heavy fuel oil #9. Study performed for Concawe. EMBSI Study No. 0791367. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2008b) *Daphnia sp.*, acute immobilization test. MRD-07-909 heavy fuel oil #3. Study performed for Concawe. EMBSI Study No. 0790942. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2008c) Fish acute toxicity test. MRD-07-911 heavy fuel oil #5. Study performed for Concawe. EMBSI Study No. 0791158. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012) *Daphnia magna*, reproduction test. MRD-11-113 heavy fuel oil #586. Study performed for Concawe. EMBSI Study No. 1111346. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Hoberman, A.M. *et al* (1995) Developmental toxicity study of clarified slurry oil (CSO) in the rat. *Fund Applied Toxicol* 28, 38-40

Przygoda, R.T. *et al* (1999) Assessment of the utility of the micronucleus test for petroleum-derived materials. *Mutation Research* 438, 145-153

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

8.10. UNREFINED / ACID TREATED OILS (UATO)

Definition / Domain: The unrefined base oils, or vacuum distillate fractions, are complex aliphatic and aromatic hydrocarbon substances. They mostly comprise highly alkylated multi-ring structures and branched alkane constituents, along with some heteroatom (nitrogen, oxygen, sulphur) - containing species, including some gums and resins. The unrefined base oil fractions are subject to further refinery process (chemical or physical) steps to convert them into lubricating oils for commercial use. Treatment with sulphuric acid partially removes aromatics and sulphur-containing species, precipitate asphaltenes and gums, and improve colour and stability.

The UATO category domain is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows.

- Derived from crude petroleum
- Refinery process
 - Produced by vacuum distillation of the residuum from atmospheric distillation
 - Vacuum distillation fractions with no further treatment (unrefined oils)
 - Vacuum distillate fractions with slight to moderate treatment with sulphuric acid to partially remove aromatics (acid treated oils)
 - Further treatment with sodium hydroxide to neutralize acid residues
- Hydrocarbon types: highly alkylated multi ring structures, branched alkanes, aromatic hydrocarbons.
- Typical boiling range: 210°C to 800°C
- Typical carbon number range: C₁₅ to C₅₀

Appendix 1 lists only those UATO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - UATO substances are liquids.

Flammable Aerosol: Not relevant - UATO substances are not in aerosol form.

Flammable Liquid: Non-flammable - UATO substances have flash point >98°C.

Flammable Solid: Not relevant - UATO substances are liquids.

Oxidising Gas: Not relevant - UATO substances are liquids.

Oxidising Liquid: UATO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - UATO substances are liquids.

Pyrophoric Liquid: UATO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - UATO substances are liquids.

Self-reactive Substance: UATO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: UATO substances do not react exothermically.

Gas under Pressure: Not relevant - UATO substances are liquids.

Organic Peroxide: UATO substances do not meet the definition of a peroxide.

Corrosive to Metal: UATO substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: UATO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: UATO substances have been tested in acute oral, dermal studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1986a)
Rat inhalation (mist)	LC ₅₀ > 5000 mg/m ³ (ARCO, 1983)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1986a)

Skin Corrosion / Irritation: Samples of UATO substances have been tested in rabbit skin irritation non-guideline tests (24h exposure, occluded), which over predicted irritation due to occluded conditions. Only slight irritation would be expected if tested under guideline conditions. Upon repeated exposure some UATO substances may cause skin dryness or cracking (API, 1986a).

Serious Eye Damage / Irritation: A sample of an UATO substance tested in rabbits showed minimal redness which resolved quickly (API, 1986a).

Respiratory or Skin Sensitization: A sample of an UATO substance showed no evidence of skin sensitization in guinea pigs. There are no reports available to indicate that UATO substances have the potential to cause respiratory sensitization (API, 1986a).

Germ Cell Mutagenicity: The mutagenic potential of UATO substances has been extensively studied in a range of *in vivo* and *in vitro* assays (Blackburn *et al*, 1984, 1986; API, 1986c; ARCO, 1987; Przygoda *et al*, 1999). Based on the available data, UATO substances are not considered to be germ cell mutagens.

Carcinogenicity: The carcinogenic potential of UATO substances has been investigated in mouse skin painting studies. Results show that UATO substances are carcinogenic (Chasey and McKee, 1993).

Reproductive Toxicity: There are no developmental toxicity data for UATO substances, but their hazards are assumed to be similar to those of UDAE substances. In a read-across developmental study from UDAE substances, heavy paraffinic distillate furfural extract produced maternal, reproductive, and foetal toxicity in Sprague-Dawley rats (Mobil, 1990b). There are no data on fertility but based on evidence from repeated dose toxicity studies, no effects on reproductive organs are expected (Mobil, 1990a).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1986a; ARCO, 1983).

Repeated Exposure: The repeat dose toxicity of UATO substances has been studied in a 28-day sub-acute study. No effects were observed (API, 1986b). Read-across subchronic studies performed on UDAE substances resulted in specific target organ toxicity in the following tissues: adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus (Mobil, 1990a; Chasey and McKee, 1993).

Aspiration: UATO substances span a range of viscosities with values reported as >2 mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: No acute toxicity studies are available for UATO substances, but suitable read-across data is available for UDAE substances. Read-across studies on acute aquatic toxicity with samples of UDAE substances show acute toxicity values greater than 1000 mg/l to fish (BP, 1994 and 1995), 35.9 mg/l to *Daphnia* (EMBSI, 2010b) and for 18.8 mg/l for algae (EMBSI, 2010a). Tests were carried out on the water accommodated fraction. Results are consistent with the predicted aquatic toxicity of UATO substances based on their hydrocarbon composition (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on *Daphnia magna* exposed to samples of UATO substances show variable chronic toxicity, with NOEL values between 0.1 and 1 mg/l (EMBSI, 2012c and 2012d).

Environmental fate (biodegradation / bioaccumulation): UATO substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable, but are inherently biodegradable. Constituents of UATO substances show measured or predicted values for log K_{ow} greater than 4 and are considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1A	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1A.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1986a) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 84-01 light paraffinic distillate (CAS 64741-50-0). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 33-30595. Washington DC: American Petroleum Institute

API (1986b) 28-day dermal toxicity study in the rabbit of API 84-01. Light paraffinic distillate (CAS 64741-50-0). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 33-31642. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 84-01, light paraffinic distillate (CAS 64741-50-0), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32801. Washington DC: American Petroleum Institute

ARCO (1983) Acute inhalation toxicity study in rats administered test article F-30-02. Study conducted by Bio-Research Laboratories Ltd. Study No. 83-0030. Los Angeles CA: ARCO

ARCO (1987) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0061. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* **1**, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* **2**, 1, 63-84

BP (1994) The acute toxicity of PSG 1860 to rainbow trout (*Oncorhynchus mykiss*). Study conducted by Safepharm Laboratories Ltd. Report No. 692/11. Brussels: BP Oil Europe

BP (1995) Assessment of the effect of PSG 1860 on the reproduction of *Daphnia magna*. Study conducted by Safepharm Laboratories Ltd. Report No. 692/12. Brussels: BP Oil Europe

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* **13**, 1, 57-65

EMBSI (2010a) Alga - growth inhibition test. Study performed for Concawe. EMBSI Study No. 0834667. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2010b) *Daphnia* - acute toxicity test. Study performed for Concawe. EMBSI Study No. 0834642A. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012c) *Daphnia* sp, reproduction test. MRD-08-346 DAE #2 and MRD-08-385 UATO. Study performed for Concawe. EMBSI Study No. 0834646. Annandale NJ. ExxonMobil Biomedical Sciences Inc.

EMBSI (2012d) *Daphnia* sp, reproduction test. MRD-08-346 DAE #2 and MRD-08-385 UATO. Study performed for Concawe. EMBSI Study No. 0834646A. Annandale NJ. ExxonMobil Biomedical Sciences Inc.

Mobil (1990a) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

Mobil (1990b) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Przygoda, R.T. *et al* (1999) Assessment of the utility of the micronucleus test for petroleum-derived materials. *Mutation Research* 438, 145-153

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

8.11. HIGHLY REFINED BASE OILS (HRBO)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced and the low level of poly-aromatic content present in the oils. Additionally, the boiling point range and the carbon number range are as follows:

- Derived from crude petroleum
- Refinery processes
 - vacuum distillation
 - severe solvent extraction
 - dewaxing (solvent or catalytic)
 - severe hydrotreatment or oleum treatment

N.B.: some category members are subject to further intermediate processing such as chemical sweetening and/or chemical neutralisation to remove or convert residues of odorous sulphur compounds.

- At a minimum, satisfies the requirements of the FDA 178.3620 B test elements:
 - UV Absorbance
 - Hot acid test
- Hydrocarbon types: saturated, naphthenic, iso-paraffinic
- Boiling point range: 218 to < 800°C
- Carbon number range: predominantly C₁₂ to C₅₀
- Very low aromatic and sulphur content

Appendix 1 lists only those HRBO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - HRBO substances are liquids.

Flammable Aerosol: Not relevant - HRBO substances are liquids.

Flammable Liquid: HRBO substances have flashpoints >112°C.

Flammable Solid: Not relevant - HRBO substances are liquids.

Oxidising Gas: Not relevant - HRBO substances are liquids.

Oxidising Liquid: HRBO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - HRBO substances are liquids.

Pyrophoric Liquid: HRBO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - HRBO substances are liquids.

Self-reactive Substance: HRBO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: HRBO substances do not react exothermically.

Gas under Pressure: Not relevant - HRBO substances are liquids.

Organic Peroxide: HRBO substances do not meet the definition of a peroxide.

Corrosive to Metal: HRBO substances do not satisfy the requirement for classification as they are not corrosive to metal.

Substance which in contact with water emits flammable gas: HRBO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of HRBO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (ARCO, 1987a)
Rat inhalation (dust/mist)	LC ₅₀ > 5 mg/l (ARCO, 1988)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (ARCO, 1987b,c)

Skin Corrosion / Irritation: Samples of HRBO substances were tested in rabbit skin irritation studies. Results obtained indicate that exposure to HRBO substances does not result in skin irritation (ARCO, 1987c). There was no evidence of skin corrosion.

Serious Eye Damage / Irritation: HRBO substances were not irritating in a guideline test for eye irritation (ARCO, 1987d).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. For skin sensitization HRBO substances were tested and showed no evidence of skin sensitization (ARCO, 1987e).

Germ Cell Mutagenicity: The mutagenic potential of HRBO substances has been tested via *in vitro* and *in vivo* tests. Results showed no evidence of mutagenic activity (EMBSI, 2003; EBSI, 1985; ARCO, 1987f; McKee *et al*, 1990). Based on the available data, HRBO substances are not considered to be germ cell mutagens.

Carcinogenicity: Carcinogenic bioassays have been conducted and confirm that HRBO substances are non-carcinogenic (EMBSI, 2001; Chasey and McKee, 1993).

Reproductive Toxicity: HRBO substances were not reproductive toxicants (OECD 421). The NOAEL for oral exposure is greater than or equal to 1000 mg/(kg_{bw}*day) and the NOAEL for dermal exposure is greater than or equal to 2000 mg/(kg_{bw}*day) (Mobil, 1987b; Schreiner *et al*, 1997; WIL Research Laboratories, 1995; Mobil, 1987c; McKee *et al*, 1987; Mobil, 1987a).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to HRBO substances (ARCO, 1987a; ARCO, 1988).

Repeated Exposure: The repeat dose toxicity of HRBO substances has been studied. There is no toxicity associated with these materials, therefore there is no specific target organ toxicity following exposure (Smith *et al*, 1996; Firriolo *et al*, 1995; Trimmer *et al*, 2004; Dalbey *et al*, 1991; Mobil, 1988; API, 1987).

Aspiration: HRBO substances span a range of viscosities reported as >3mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on WAF of HRBO substances report LL50 (96h) at >10,000 mg/l for fish (IWL, 1992). For aquatic invertebrates the LL50 (48h) was >100 mg/l

(Petro-Canada, 2008a) and the weight of evidence indicates no toxicity to aquatic algae (Petro-Canada, 2008b).

Chronic (long-term) Aquatic Hazard: No chronic toxicity data is available for HRBO substances, but appropriate read-across data are available for LBO substances (Girling, 1995). The key study indicates a NOEL of 3 mg/l based on reproduction for aquatic invertebrates (EMBSI, 2012). This is supported by a QSAR prediction using PETROTOX, which indicates no chronic toxicity (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): HRBO substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data on key constituents, HRBO substances are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of HRBO substances show measured or predicted values for log K_{ow} greater than 4 and are considered potentially bioaccumulative (Lampi *et al*, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

Precautionary statements:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label) *

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P405: Store locked up. *

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

* This P-statement is not automatically triggered by the classification and labelling rules for these substances, however based on its physical chemical properties having a viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ @ 40°C it is advised when used in consumer products.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label) **

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up. *

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

* This P-statement is not automatically triggered by the classification and labelling rules for these substances, however based on its physical chemical properties having a viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ @ 40°C it is advised when used in consumer products.

REFERENCES

API (1987) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

ARCO (1987a) Acute oral toxicity study in rats administered test article F-53-01 ARCOprime 400. Mideco Study No. 55926. Los Angeles CA: ARCO

ARCO (1987b) Acute dermal toxicity study in rabbits administered F-53-01 ARCOprime 400. UBTL/MIDECO Study No. 55927. Los Angeles CA: ARCO

ARCO (1987c) Primary dermal irritation study in rabbits administered test article F-52-01 ARCOprime 70. Mideco Study No. 55923. Los Angeles CA: ARCO

ARCO (1987d) Primary eye irritation study in rabbits administered test article F-52-01 ARCOprime 70. Mideco Study No. 55924. Los Angeles CA: ARCO

ARCO (1987e) Dermal sensitisation study in albino guinea pigs administered with F-52-01 ARCOprime 70. Mideco Study No. 55925. Los Angeles CA: ARCO

ARCO (1987f) Evaluation of chromosome aberrations in Chinese Hamster Ovary (CHO) cells. Study No. T4288.337. Los Angeles CA: ARCO

ARCO (1988) Acute inhalation toxicity study in rats administered test article F-52-01. Study conducted by Bio-Research Laboratories Ltd. Study No. 82188. Los Angeles CA: ARCO

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* **13**, 1, 57-65

Dalbey, W. *et al* (1991) Four-week inhalation exposures of rats to aerosols of three lubricant base oils. *J Appl Toxicol* 11, 4, 297-302

EBSI (1985) Mammalian mutagenesis studies in L5178Y mouse lymphoma cells. Study conducted by Bio/Dynamics Inc. Study No. V00027. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2001) Combined chronic toxicity/carcinogenicity study of white oil in Fischer 344 rats. Study performed for Concawe. EMBSI Study No. 105970. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2003) Modified Ames test results. Study No. 168825B. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012) *Daphnia magna*, reproduction test. Light Paraffinic Distillate Solvent Extract (MRD-08-346) Light Paraffinic Distillate (MRD-08-385) Catalytic Dewaxed Light Paraffinic Oil (MRD-09-435). Study performed for Concawe. EMBSI Study No. 0834646. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Firriolo, J.M. *et al* (1995) Comparative 90-day feeding study with low-viscosity white mineral oil in Fischer-344 and Sprague-Dawley-derived CRL:CD rats. *Toxicologic Pathology* 23, 1, 26-33

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

IWL (1992) Fisch test, akute Toxizität. Study conducted for Kuwait Petroleum Research & Technology B.V. Study No. Lab 712/3243/2.000. Köln: Institut für gewerbliche Wasserwirtschaft und Luftreinhaltung e.V.

Lampi, M. *et al* (2010) An evaluation of the persistence, bioaccumulation and toxicity of petroleum hydrocarbons. Report prepared for Concawe. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

McKee, R.H. *et al* (1987) Developmental toxicity of EDS recycle solvent and fuel oil. *Toxicology* 46, 205-215

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1987a) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1987b) Stock 461 rat reproduction study. Mobil Environ. and Health Sci. Lab. Study No. 40921-IA. Princeton NJ: Mobil Oil Corporation

Mobil (1987c) Stock 461 rat teratology study. Mobil Environ. and Health Sci. Lab. Study No. 40922. Princeton NJ: Mobil Oil Corporation

Mobil (1988) Stock 461 rat subchronic study. Mobil Environ. and Health Sci. Lab. Study No. 40921-IB. Princeton NJ: Mobil Oil Corporation

Petro-Canada (2008a) *Daphnia magna* toxicity test report. Study performed by AquaTox Testing & Consulting Inc. Study No. 212933. Mississauga ON: Petro-Canada Research & Development

Petro-Canada (2008b) *Pseudokirchneriella subcapitata* 72-hour growth inhibition toxicity test report. Study performed by AquaTox Testing & Consulting Inc. Study No. 212933. Mississauga ON: Petro-Canada Research & Development

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Schreiner, C. *et al* (1997) Toxicity evaluation of petroleum blending streams: reproductive and developmental effects of hydrodesulfurized kerosine. *J Toxicol Environ Health* 52, 211-229

Smith, J.H. *et al* (1996) Ninety-day feeding study in Fischer-344 rats of highly refined petroleum-derived food-grade white oils and waxes. *Toxicologic Pathology* 24, 2, 214-230

Trimmer, G.W. *et al* (2004) Results of chronic dietary toxicity studies of high viscosity (P70H and P100H) white mineral oils in Fischer 344 rats. *Toxicologic Pathology* 32, 439-447

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

8.12. OTHER LUBRICANT BASE OILS (LBO)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from crude petroleum which is refined by atmospheric and vacuum distillation
- Refinery processes
 - solvent extraction (phenol, furfural and N-methyl pyrrolidone)
 - solvent deasphalting (precipitation with propane or butane)
 - solvent dewaxing (or precipitation with methyl ethyl ketone)
 - catalyst dewaxing (isomerisation)
 - acid treatment (sulphuric acid or oleum)
 - hydrocracking (hydrogenation and cracking combined)
 - hydrogen treatment
 - hydro finishing
 - clay treatment
 - iso-dewaxing
- Hydrocarbon types: aromatics, paraffins, naphthenics
- Typical boiling ranges of 200°C to 800°C
- Typical carbon number range: predominantly C₁₂ to C₁₂₀

Appendix 1 lists only those LBO substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - LBO substances are liquids.

Flammable Aerosol: Not relevant - LBO substances are not in aerosol form.

Flammable Liquid: LBO substances typically have flash points >98°C.

Flammable Solid: Not relevant - LBO substances are liquids.

Oxidising Gas: Not relevant - LBO substances are liquids.

Oxidising Liquid: LBO substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - LBO substances are liquids.

Pyrophoric Liquid: LBO substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - LBO substances are liquids.

Self-reactive Substance: LBO substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: LBO substances do not react exothermically.

Gas under Pressure: Not relevant - LBO substances are liquids.

Organic Peroxide: LBO substances do not meet the definition of a peroxide.

Corrosive to Metal: LBO substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: LBO substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of LBO substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982; API, 1986b)
Rat inhalation (dust/mist)	LC ₅₀ > 5.53 mg/l (EBSI, 1988)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1986a)

Skin Corrosion / Irritation: Samples of LBO substances have been tested in rabbit skin irritation studies. The majority of the data were derived using a 24 hour occluded exposure protocol. The study performed on the “insufficiently refined” LBO substances showed moderate irritation. The study was performed for 24 hours rather than 4 hours and consequently the result from a shorter exposure time is not expected to cause irritation. In studies on “sufficiently refined” LBO substances no irritation was observed. There was no evidence of skin corrosion (API, 1982; API, 1986b).

Serious Eye Damage / Irritation: The effects of LBO substances on the eye have been investigated in rabbits using a number of samples. All of the LBO substances tested were non-irritating to the eyes (API, 1982; API, 1986b).

Respiratory or Skin Sensitization: Tests in guinea pig with LBO substances showed no evidence of skin sensitization (API, 1982; API, 1986b). There are no reports available to indicate a potential to cause respiratory sensitization.

Germ Cell Mutagenicity: The mutagenic potential of LBO substances has been extensively studied in a range of *in vivo* and *in vitro* assays. The majority of the studies showed no evidence of mutagenic activity (Blackburn *et al.*, 1984; Blackburn *et al.*, 1986; API, 1986d; API, 1986c; ARCO, 1987a; ARCO, 1987b; Przygoda *et al.*, 1999; McKee RH, *et al.*, 1990). Based on the available data, LBO substances are not considered to be germ cell mutagens.

Carcinogenicity: The carcinogenic potential of LBO substances has been investigated in animals following dermal exposure. Based on these findings, “insufficiently refined” LBO substances are carcinogenic and the “sufficiently refined” LBO substances are not carcinogenic (Doak, *et al.*, 1983; Chasey and McKee, 1993).

Reproductive Toxicity: Results of developmental and reproductive toxicity studies on “sufficiently refined” LBO substances show no evidence of developmental or reproductive toxicity in rats. (WIL Research Laboratories, 1995; Mobil, 1987) There are no developmental toxicity data for “insufficiently refined” LBO substances, but their hazards are assumed to be similar to those of UDAE substances. In a read-across developmental study from UDAE substances, heavy paraffinic distillate furfural extract produced maternal, reproductive, and foetal toxicity in rats (Schreiner, *et al.*, 1997; Mobil, 1989). Therefore, LBO substances are classified accordingly. For the “insufficiently refined” LBO substances, there are no data on fertility but based on evidence from repeated dose toxicity studies, no effects on reproductive organs are expected.

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1982; API, 1986b; API, 1987b; EBSI, 1988).

Repeated Exposure: The repeat dose toxicity of LBO substances has been investigated by dermal and inhalation routes for periods between 4 weeks and up to 2 years. For “insufficiently refined” LBO substances, read-across subchronic studies performed on UDAE substances resulted in unspecific target organ toxicity in the following tissues: adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus (Mobil, 1990; Chasey and McKee, 1993; API, 1986a). For

“sufficiently refined” LBO substances, Repeat dose inhalation and dermal studies showed no systemic effects (Dalbey *et al.*, 1991; API, 1987a; Mobil, 1983; EBSI, 1991).

Aspiration: LBO substances span a range of viscosities with values reported as $>2 \text{ mm}^2/\text{s}$ at 40°C .

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: All acute aquatic toxicity studies with fish, invertebrates and algae on samples of LBO substances show acute toxicity values greater than 100 mg/l . These tests were carried out on water accommodated fractions (EBSI, 1995; Petro Canada, 2008; Croucher and Girling, 1988).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on samples of LBO substances show chronic toxicity values greater than 1 mg/l for invertebrates. These tests were carried out on water accommodated fractions (EMBSI, 2012; Girling, 1995).

Environmental fate (biodegradation / bioaccumulation): LBO substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of LBO substances show predicted values for $\log K_{ow}$ ranging from 2 to greater than 6 and are considered potentially bioaccumulative (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the ‘worst-case’ C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

REFERENCES

API (1982) Acute toxicity tests of API 78-9 paraffinic oil, nominal viscosity 70 SUS/100°F (CAS 64742-56-9). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33104. Washington DC: American Petroleum Institute

API (1986a) 28-day dermal toxicity study in the rabbit of API 83-12. Hydrotreated light naphthenic distillate (CAS 64742-53-6). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 33-30499. Washington DC: American Petroleum Institute

API (1986b) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-12 hydrotreated light naphthenic distillate (CAS 64742-53-6). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 33-30592. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 83-12, hydrotreated light naphthenic distillate (CAS 64742-53-6), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32802. Washington DC: American Petroleum Institute

API (1986d) Mutagenicity of API 83-15, heavy naphthenic distillate (CAS 64742-52-5), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32800. Washington DC: American Petroleum Institute

API (1987a) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

API (1987b) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-12 hydrotreated light naphthenic distillate. Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 34-32775. Washington DC: American Petroleum Institute

ARCO (1987a) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0059. Los Angeles CA: ARCO

ARCO (1987b) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0054. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* 13, 1, 57-65

Croucher, E.A. and Girling, A.E. (1988) Oils: acute toxicity of four oils to *Daphnia magna* and *Gammarus pulex*. Report No. SBGR.88.075. Sittingbourne: Shell Research Ltd

Dalbey, W. *et al* (1991) Four-week inhalation exposures of rats to aerosols of three lubricant base oils. *J Appl Toxicol* 11, 4, 297-302

Doak, S.M.A. *et al* (1983) The carcinogenic potential of twelve refined mineral oils following long-term topical application. *Br J Cancer* 48, 429-436

EBSI (1988) Four hour acute inhalation toxicity study in rats. MRD-87-102. EBSI Study No. 210215. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1991) Dermal carcinogenesis assay in C₃H/HeNCr1BR mice. Report prepared for Exxon Company USA. EBSI Study No. 201111. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995) Fish, acute toxicity test. MRD-94-981 basestock solvent neutral 600. Report prepared for Exxon Company International. EBSI Study No. 198140. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2012) Daphnia magna, reproduction test. Light Paraffinic Distillate Solvent Extract (MRD-08-346) Light Paraffinic Distillate (MRD-08-385) Catalytic Dewaxed Light Paraffinic Oil (MRD-09-435). Study performed for Concawe. EMBSI Study No. 0834646. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

Petro-Canada (2008) 72-hour growth inhibition toxicity test report. *Pseudokirchneriella subcapitata*. Study performed by AquaTox Testing & Consulting Inc. Study No. 213706. Mississauga ON: Petro-Canada Research & Development

Przygoda, R.T. *et al* (1999) Assessment of the utility of the micronucleus test for petroleum-derived materials. *Mutation Research* 438, 145-153

Schreiner, C. *et al* (1997) Toxicity evaluation of petroleum blending streams: reproductive and developmental effects of hydrosulfurized kerosine. *J Toxicol Environ Health* 52, 211-229

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

8.13. UNTREATED DISTILLATE AROMATIC EXTRACTS (UDAE)

Definition / Domain: Distillate Aromatic Extracts is the generic name for extracts of a vacuum distillate produced as by-products in the refining of lube base oils and waxes. Vacuum distillates (lubricating oil basestocks) are extracted with a solvent to selectively remove the aromatic compounds (especially 3-7 fused ring PAC). The solvent is then stripped from the resulting extract, and the remaining aromatic concentrate (aromatic extract) is the untreated distillate aromatic extract (UDAE). This may be further processed and the result is a treated DAE (TDAE), which are included in a separate category. UDAE substances are not intentional mixtures of chemicals but are complex combinations of hydrocarbon species.

The category domain is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from crude petroleum
- Refinery process:
 - Solvent extraction of vacuum distillate fractions (without further processing)
- Hydrocarbon types: mostly alkylated PAC, naphthenic and iso-paraffinic
- Typical Boiling range: 250°C to 640°C
- Typical carbon number range: C₁₅ to C₅₀

Appendix 1 lists only those UDAE substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - UDAE substances are liquids.

Flammable Aerosol: Not relevant - UDAE substances are not in aerosol form.

Flammable Liquid: UDAE substances typically have flash points > 140°C.

Flammable Solid: Not relevant - UDAE substances are liquids.

Oxidising Gas: Not relevant - UDAE substances are liquids.

Oxidising Liquid: UDAE substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - UDAE substances are liquids.

Pyrophoric Liquid: UDAE substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - UDAE substances are liquids.

Self-reactive Substance: UDAE substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: UDAE substances do not react exothermically.

Gas under Pressure: Not relevant - UDAE substances are liquids.

Organic Peroxide: UDAE substances do not meet the definition of a peroxide.

Corrosive to Metal: UDAE substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: UDAE substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of UDAE substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1986b)
Rat inhalation	LC ₅₀ > 5 mg/l (ARCO, 1983)
Rabbit dermal	LD ₅₀ > 3000 mg/kg _{bw} (API, 1986b)

Skin Corrosion / Irritation: Samples of UDAE substances have been tested in rabbit skin irritation non-guideline tests (24h exposure, occluded), which over predict irritation due to occluded conditions. No more than slight irritation would be expected in a guideline study (API, 1986b). Upon repeated exposure some UDAE substances may cause skin dryness or cracking.

Serious Eye Damage / Irritation: The effects of UDAE substances on the eye have been investigated in rabbits. Results showed minimal redness which resolved quickly (API, 1986b).

Respiratory or Skin Sensitization: Tested in guinea pigs, samples of UDAE substances showed no evidence of skin sensitization (API, 1986b). There are no reports available to indicate UDAE substances have the potential to cause respiratory sensitization.

Germ Cell Mutagenicity: The mutagenic potential of UDAE substances has been extensively studied in a range of *in vivo* and *in vitro* assays (Blackburn *et al.*, 1984 and 1986; API, 1986c; Mobil, 1987). Based on the available data, UDAE substances are not considered germ cell mutagens.

Carcinogenicity: The carcinogenic potential of UDAE substances has been investigated in mouse skin painting studies. Results show that UDAE substances are carcinogenic (API, 1989).

Reproductive Toxicity: In a developmental study a distillate aromatic extract caused maternal, reproductive, and foetal toxicity in rats (WIL, 2012). There are no data on fertility but based on evidence from repeated dose toxicity studies, effects on male reproductive organs were observed via oral exposure (Mobil, 1990).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1986b; ARCO, 1983).

Repeated Exposure: The repeat dose toxicity of UDAE substances has been studied in a 28-day sub-acute study via dermal exposure. No evident effects were observed (API, 1986a). However, results from subchronic studies performed on UDAE substances via oral and dermal exposure resulted in specific target organ toxicity in the following tissues: adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus. Additional effects were observed in the prostate, testes and seminal vesicles in the subchronic study via oral exposure. The NOAEL was determined to be < 30 mg/kg_{bw} (Mobil, 1990).

Aspiration: UDAE substances span a range of viscosities with values reported as >10 mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Studies on acute aquatic toxicity with samples of UDAE substances show acute toxicity values greater than 1000 mg/l for fish, 35.9 mg/L (BP, 1994) for Daphnia (EMBSI,

2010b) and 18.8 mg/l for algae (EMBSI, 2010a). Tests were carried out on water accommodated fractions.

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on *Daphnia magna* exposed to samples of UDAE substances show variable chronic toxicity, with NOEL values between 0.1 and 1 mg/l (EMBSI, 2012a and 2012b).

Environmental fate (biodegradation / bioaccumulation): UDAE substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, UDAE substances are not predicted to be readily biodegradable but are inherently biodegradable. Constituents of UDAE substances show measured or predicted values for $\log K_{ow} \geq 4$ and are considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1986a) 28-day dermal toxicity study in the rabbit. API 83-16 light paraffinic distillate solvent extract (CAS 64742-05-8). Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 33-31695. Washington DC: American Petroleum Institute

API (1986b) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-16 light paraffinic distillate solvent extract (CAS 64742-05-8). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 33-31226. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 83-16 light paraffinic distillate solvent extract (petroleum) (CAS 64742-05-8) in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Health Environ. Sci. Dep. Rep. 33-32803. Washington DC: American Petroleum Institute

API (1989) 24-Month dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C₃H/HeJ mice. Study No. 36-33220. Washington DC: American Petroleum Institute

ARCO (1983) Acute inhalation toxicity study in rats administered test article F-30-02. Study conducted by Bio-Research Laboratories Ltd. Study No. 81677. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

BP (1994) The acute toxicity of PSG 1860 to rainbow trout (*Oncorhynchus mykiss*). Study conducted by Safepharm Laboratories Ltd. Report No. 692/11. Brussels: BP Oil Europe

EMBSI (2010a) Alga - growth inhibition test. Study performed for Concawe. EMBSI Study No. 0834667. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2010b) Daphnia - acute toxicity test. Study performed for Concawe. EMBSI Study No. 0834642A. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2012a) Daphnia sp, reproduction test. MRD-08-346 DAE #2 and MRD-08-385 UATO. Study performed for Concawe. EMBSI Study No. 0834346. Annandale NJ. ExxonMobil Biomedical Sciences Inc.

EMBSI (2012b) Daphnia sp, reproduction test. MRD-08-346 DAE #2 and MRD-08-385 UATO. Study performed for Concawe. EMBSI Study No. 0834346A. Annandale NJ. ExxonMobil Biomedical Sciences Inc.

Mobil (1987) Micronucleus assay of bone marrow red blood cells from rats treated for thirteen weeks with 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 61738. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

WIL (2012) A Dermal Prenatal Developmental Toxicity Study of Extract, Light Paraffinic Distillate Solvent in Rats. Testing Laboratory: Wil Research Laboratories. Owner Company: American Petroleum Institute

8.14. TREATED DISTILLATE AROMATIC EXTRACTS (TDAE)

Definition / Domain: Distillate Aromatic Extracts is the generic name for extracts of a vacuum distillate produced as by-products in the refining of lube base oils and waxes. Vacuum distillates (lubricating oil basestocks) are extracted with a solvent to selectively remove the aromatic compounds (especially 3-7 fused ring PAC). The solvent is then stripped from the resulting extract, and the remaining aromatic concentrate (aromatic extract) is the untreated distillate aromatic extract (UDAE), which are included in a separate category. The distillate aromatic extract may be further processed and the result is a treated DAE (TDAE) produced to meet physical-chemical and technical specifications, rather than chemical composition. TDAE substances are not intentional mixtures of chemicals but are complex combinations of hydrocarbon species.

The category domain of TDAE substances is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from crude petroleum
- Refinery process:
 - Solvent extraction of vacuum distillate fractions and further processing such as:
 - Hydrotreatment
 - Hydrodesulphurization
 - Clay-treatment
 - Acid-treatment
 - Carbon-treatment
 - Further solvent extraction
- Hydrocarbon types: mostly alkylated PAC, naphthenic and iso-paraffinic. TDAE subjected to hydrotreatment may significantly decrease levels of PAC contained in them.
- Typical boiling range: 250°C to 640°C
- Typical carbon number range: C₁₃ to C₅₀

Appendix 1 lists only those TDAE substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - TDAE substances are liquids.

Flammable Aerosol: Not relevant - TDAE substances are not in aerosol form.

Flammable Liquid: TDAE substances typically have flash points >140°C.

Flammable Solid: Not relevant - TDAE substances are liquids.

Oxidising Gas: Not relevant - TDAE substances are liquids.

Oxidising Liquid: TDAE substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - TDAE substances are liquids.

Pyrophoric Liquid: TDAE substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - TDAE substances are liquids.

Self-reactive Substance: TDAE substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: TDAE substances do not react exothermically.

Gas under Pressure: Not relevant - TDAE substances are liquids.

Organic Peroxide: TDAE substances do not meet the definition of a peroxide.

Corrosive to Metal: TDAE substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: TDAE substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of TDAE substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982a; ARCO, 1983b, 1985a; UBTL, 1983a, b, c)
Rat inhalation	LC ₅₀ > 5 mg/l (ARCO, 1983a, c, d; EBSI, 1988a, b)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (ARCO, 1973, 1982, 1984a, b, c, 1985b; API 1982b, c, d, e, f)

Skin Corrosion / Irritation: Samples of TDAE substances have been tested in rabbit skin irritation non-guideline tests (24h exposure, occluded), which over predict irritation due to occluded conditions. No more than slight irritation would be expected in a guideline study. Upon repeated exposure some TDAE substances may cause skin dryness and cracking (API, 1986a; API, 1982f, g; Trimmer *et al.*, 1989).

Serious Eye Damage / Irritation: The irritating potential of samples of TDAE substances has been investigated in rabbits. Results showed minimal conjunctival chemosis which resolved quickly (API, 1986a; API, 1982g).

Respiratory or Skin Sensitization: Tested in guinea pigs and human volunteers, samples of TDAE substances showed no evidence of skin sensitization. There are no reports available to indicate TDAE substances have the potential to cause respiratory sensitization (API, 1986a; API, 1982g; EBSI, 1988c, d; Trimmer *et al.* 1989).

Germ Cell Mutagenicity: The mutagenic potential of samples of TDAE substances has been extensively studied in a range of *in vivo* and *in vitro* assays. Based on the available data, TDAE substances are not considered germ cell mutagens (Blackburn *et al.*, 1984, 1986; API, 1986c, d; Mobil, 1987a; McKee, *et al.*, 1990).

Carcinogenicity: The carcinogenic potential of samples of TDAE substances has been investigated in mouse skin painting studies. Results suggest that TDAE substances with $\geq 3\%$ DMSO extractables as measured by IP346 have the potential to cause skin tumours (Gradiski *et al.*, 1983). Samples of TDAE substances with lower levels of polycyclic aromatic compounds (PAC) (with $< 3\%$ DMSO extractables) are not carcinogenic (Doak *et al.*, 1985).

Reproductive Toxicity: The reproductive toxicity of TDAE substances with less than 3% DMSO extractables is read-across to LBO substances. Results of developmental and reproductive toxicity studies on “sufficiently refined” LBO substances did not show any evidence of developmental or reproductive toxicity in rats (WIL Research Laboratories, 1995; Mobil, 1987b). There are no developmental toxicity data for TDAE substances, but their hazards are assumed to be similar to those of UDAE substances. In a read-across developmental study from UDAE substances, heavy paraffinic distillate furfural extract produced maternal, reproductive, and foetal toxicity in rats (Mobil, 1989). For TDAE substances with $\geq 3\%$ DMSO extractables, there are no data on fertility but based on evidence from repeated dose toxicity studies of representative samples, no effects on reproductive organs are expected (Mobil, 1987b).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1986b; API, 1982; ARCO, 1983; EBSI, 1988).

Repeated Exposure: The repeat dose toxicity of samples of TDAE substances has been investigated by oral, dermal and inhalation routes for periods between 4 weeks and up to 2 years. For TDAE substances with $\geq 3\%$ DMSO extractables, read-across subchronic studies resulted in specific target organ toxicity in the following tissues: adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus (Mobil, 1990; API, 1986a). For TDAE substances with $< 3\%$ DMSO extractables, repeat dose inhalation and dermal studies showed no systemic effects (Dalbey *et al.*, 1991; Dalbey, 2001; API, 1987; Mobil, 1983; EBSI, 1991a, b; Whitman *et al.*, 1989).

Aspiration: TDAE substances span a range of viscosities with values reported as $> 10 \text{ mm}^2/\text{s}$ at 40°C .

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute aquatic toxicity studies on samples of TDAE substances, carried out using the WAF methodology, report acute toxicity values for fish, crustaceans and algae greater than 100 mg/l (BP, 1994; BP, 1995; EMBSI, 2010a and 2010b).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on *Daphnia magna* exposed to a sample of a TDAE substance show a NOEL value above 1000 mg/l (BP, 1995).

Environmental fate (biodegradation / bioaccumulation): TDAE substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, TDAE substances are not predicted to be readily biodegradable but are inherently biodegradable. Constituents of TDAE substances show measured or predicted values for $\log K_{ow} \geq 4$ and are therefore considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the ‘worst-case’ C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982a) Acute toxicity tests of API 78-9 paraffinic oil, nominal viscosity 70 SUS/100°F (CAS 64742-56-9). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33104. Washington DC: American Petroleum Institute

API (1982b) Acute toxicity tests of API 78-10 Paraffinic oil, nominal viscosity 150 SUS/100°F (CAS. 64742-56-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33105. Washington DC: American Petroleum Institute

API (1982c) Acute toxicity tests of API 79-3 Paraffinic oil, nominal viscosity 350 SUS/100°F (CAS 64742-65-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33067. Washington DC: American Petroleum Institute

API (1982d) Acute toxicity tests of API 79-4 Paraffinic oil, nominal viscosity 550 SUS/100°F (CAS 64742-65-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33066. Washington DC: American Petroleum Institute

API (1982e) Acute toxicity tests of API 79-5 Paraffinic oil, nominal viscosity 800 SUS/100°F (CAS 64742-65-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33068. Washington DC: American Petroleum Institute

API (1982f) Acute toxicity tests of API 78-10 Paraffinic oil, nominal viscosity 150 SUS/100°F (CAS 64742-56-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33105. Washington DC: American Petroleum Institute

API (1982g) Acute toxicity tests of API 78-9 Paraffinic oil, nominal viscosity 70 SUS/100°F (CAS 64742-56-9). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33104. Washington DC: American Petroleum Institute

API (1986a) 28-day dermal toxicity study in the rabbit. API 83-16 light paraffinic distillate solvent extract (CAS 64742-05-8). Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 33-31695. Washington DC: American Petroleum Institute

API (1986b) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-16 light paraffinic distillate solvent extract (CAS 64742-05-8). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 33-31226. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 83-16 light paraffinic distillate solvent extract (petroleum) (CAS 64742-05-8) in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Health Environ. Sci. Dep. Rep. 33-32803. Washington DC: American Petroleum Institute

API (1986d) Mutagenicity of API 83-15, heavy naphthenic distillate (CAS 64742-52-5), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32800. Washington DC: American Petroleum Institute

API (1987) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

ARCO (1973) Acute dermal toxicity study in albino rabbits. Study conducted by Industrial Bio-Test Laboratories Inc. Report no. ATX-73-0004. Los Angeles CA: ARCO

ARCO (1982) Acute toxicity studies of Tufflo 491. Study No. ATX-82-0035. Los Angeles CA: ARCO

ARCO (1983a) Acute inhalation toxicity study in rats administered test article F-30-02. Study conducted by Bio-Research Laboratories, Ltd. Study No. 81677. Los Angeles CA: ARCO

ARCO (1983b) Acute oral toxicity study in rats administered 1095 extract oil. Study No. ATX-83-0025. Los Angeles CA: ARCO

ARCO (1983c) Acute inhalation toxicity study in rats administered test article F-30-02. Study conducted by Bio-Research Laboratories, Ltd. Study No. ATX-83-0030. Los Angeles CA: ARCO

ARCO (1983d) Acute inhalation toxicity study in rats administered test article F-38-01. Study conducted by Bio-Research Laboratories, Ltd. Study No. 81681. Los Angeles CA: ARCO

ARCO (1984a) Acute dermal toxicity study in rabbits administered test article F-30-01 1095 extract oil. Study No. TR-05-390-041. Los Angeles CA: ARCO

ARCO (1984b) Acute dermal toxicity study in rabbits administered test article F-31-01 2590 extract oil. Study No. TR-05-390-046. Los Angeles CA: ARCO

ARCO (1984c) Acute dermal toxicity study in rabbits administered test article F-32-01 6090 extract oil. Study No. TR-05-390-051. Los Angeles CA: ARCO

ARCO (1985a) Acute oral toxicity study of Tufflo 491 in rats. Study conducted by Biosearch, Inc. Study No. ATX-84-0046. Los Angeles CA: ARCO

ARCO (1985b) Acute dermal toxicity study in rabbits administered test article F-47-01 Tufflo 491. Study conducted by Biosearch, Inc. Study No. ATX-84-0047. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

BP (1994) The acute toxicity of PSG 1861 to rainbow trout (*Oncorhynchus mykiss*). Study conducted by Safepharm Laboratories Ltd. Report No. 692/14. Brussels: BP Oil Europe

BP (1995) Assessment of the effect of PSG 1861 on the reproduction of *Daphnia magna*. Study conducted by Safepharm Laboratories Ltd. Report No. 692/15. Brussels: BP Oil Europe

Dalbey, W. *et al* (1991) Four-week inhalation exposures of rats to aerosols of three lubricant base oils. *J Appl Toxicol* 11, 4, 297-302

Dalbey, W. E. (2001) Subchronic inhalation exposures to aerosols of three petroleum lubricants. *Am Ind Hyg Assoc J* 62, 49-56

Doak, S.M.A. *et al* (1985) Carcinogenic potential of hydrotreated petroleum aromatic extracts. *Br J Ind Med* 42, 380-388

EBSI (1988a) Four hour acute inhalation toxicity study in rats. MRD-87-102. EBSI Study No. 210215. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1988b) Four Hour Acute Inhalation Toxicity Study in Rats. Testing laboratory: Exxon Biomedical Sciences, Inc. (East Millstone, New Jersey, USA). Report no.: 210115. Owner company: Exxon Biomedical Sciences, Inc. (East Millstone, New Jersey). Study number: 88 MRL 105. Report date: 1988-05-12

EBSI (1988c) Evaluation of the skin irritating and sensitizing propensities of MRD-88-290 in humans. Study conducted by Product Investigations Inc. Report No. PI-5339. Study No. 88 MRL 297. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1988d) Evaluation of the skin irritating and sensitizing propensities of MRD-88-291 in humans. Study conducted by Product Investigations Inc. Report No. PI-5340. Study No. 88 MRL 298. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1991a) 14-day subchronic inhalation toxicity in rats. MRD-87-099. EBSI Study No. 209918. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1991b) 14-day subchronic inhalation toxicity in rats. MRD-87-101. EBSI Study No. 210118. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2010a) Alga- growth inhibition test. Study performed for Concawe. EMBSI Study No.0834667. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

EMBSI (2010b) Daphnia - acute toxicity test. Study performed for Concawe. EMBSI Study No. 0834642A. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Gradiski, D. *et al* (1983) The carcinogenic effect of a series of petroleum-derived oils on the skin of mice. *Environmental Research* 32, 258-268

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987a) Micronucleus assay of bone marrow red blood cells from rats treated for thirteen weeks with 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 61738. Princeton NJ: Mobil Oil Corporation

Mobil (1987b) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

Trimmer, G. W. *et al.* (1989). Evaluation of the dermal toxicity of paraffinic lube oils. *Toxicologist* 9, 162

UBTL (1983a) Acute oral toxicity study in rats administered test article F-33-01. UBTL Study No. TR-05-390-022. Salt Lake City UT: UBTL

UBTL (1983b) Acute oral toxicity study in rats administered 2590 extract oil. UBTL Study No. TR-05-390-047 and TR-05-390-027. Salt Lake City UT: UBTL

UBTL (1983c) Acute oral toxicity study in rats administered test article F-35-01 6090/95 oil. UBTL Study No. TR-05-390-032. Salt Lake City UT: UBTL

Whitman, F.T. *et al* (1989) Evaluation of the acute and subacute inhalation toxicity of lubricating oil mists. *The Toxicologist* 9, 143

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

8.15. RESIDUAL AROMATIC EXTRACTS (RAE)

Definition / Domain: The domain of this category is established by the refining process by which the category members are produced and the boiling point range and the carbon number range as follows:

- Derived from crude petroleum
- Refinery processes
 - Atmospheric distillation
 - Vacuum distillation
 - Propane extraction (deasphalting)
 - Solvent extraction
- Hydrocarbon types: alkylated aromatics, mixed aromatic cycloalkanes, and cycloparaffins.
- Boiling point range: >380°C
- Carbon number range: predominantly > C₂₅

Appendix 1 lists only those RAE substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - RAE substances are liquids at ambient temperature.

Flammable Aerosol: Not relevant - RAE substances are not in aerosol form.

Flammable Liquid: RAE substances typically have flash points greater than 250°C.

Flammable Solid: Not relevant - RAE substances are liquids at ambient temperature.

Oxidising Gas: Not relevant - RAE substances are liquids at ambient temperature.

Oxidising Liquid: RAE substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - RAE substances are liquids at ambient temperature.

Pyrophoric Liquid: RAE substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - RAE substances are liquids at ambient temperature.

Self-reactive Substance: RAE substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: RAE substances do not react exothermically.

Gas under Pressure: Not relevant - RAE substances are liquids.

Organic Peroxide: RAE substances do not meet the definition of a peroxide.

Corrosive to Metal: RAE substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: RAE substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of RAE substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1986)
Rat inhalation	LC ₅₀ > 5 mg/l (ARCO, 1983)
Rabbit dermal	LD ₅₀ > 3000 mg/kg _{bw} (API, 1986)

Skin Corrosion / Irritation: No primary skin irritation studies were located for RAE substances; however, a read-across skin irritation study from a UDAE substance was identified which was conducted under occluded conditions for 24 hours instead of semi-occluded conditions for 4 hours (API, 1986). No more than slight irritation is expected in a guideline study. Additionally, RAE substances did not elicit skin irritation based on observations made during repeated dermal exposure studies (API, 1986). There was no evidence of skin corrosion.

Serious Eye Damage / Irritation: Based on read-across to studies conducted with UDAE substances, results indicate that RAE substances would not be expected to cause irritation (API, 1986).

Respiratory or Skin Sensitization: Based on a read-across study from a UDAE substance, RAE substances are not expected to be skin sensitizers (API, 1986).

Germ Cell Mutagenicity: The mutagenic potential of RAE substances has been studied in both *in vitro* and *in vivo* investigations. Based on the available data, RAE substances are not considered to be germ cell mutagens (Blackburn *et al*, 1996; Petrolabs, 1998a, b, c; EBSI, 1997a, b; Institute Pasteur de Lille, 2000; CIT, 2001; Concawe, 2012; Charles River, 2021a, b).

Carcinogenicity: RAE substances have been tested in mouse skin painting assays. Results indicate that some RAE substances can cause dermal carcinogenic lesions. Carcinogenic activity is likely related to the content of biologically active polycyclic aromatic hydrocarbons, which can be predicted based on results from modified Ames tests. Based on the limited evidence available, the relevance of these data for humans remains inconclusive. Therefore, RAE substances should be suspected of causing cancer (EMBSI, 2005; Mobil, 2001; Kane *et al*, 1984; BP, 1991; Mobil, 1991).

Reproductive Toxicity: There are no data on fertility but based on evidence from repeated dose toxicity studies, no effects on reproductive organs. (Mobil, 1990). In a developmental toxicity study conducted with a RAE substance, no effects were observed (Mobil, 1989). The first results of the testing proposal for reproductive toxicity are available for 4 key developmental toxicity studies (OCDE 414) by oral route (PNDT study performed on each CAS, on both rat and rabbit). They confirm that RAEs are not classified as a developmental toxicant (Charles River, 2021e, f).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity. (API, 1986; ARCO, 1983).

Repeated Exposure: There are two key studies for oral exposure, NOAELs were 1000 mg/kg/day in one study and 100 (females and 300 (males) mg/kg/day in the other study (Charles River, 2021c, d). There was no systemic toxicity in repeat dose toxicity studies (Mobil, 1990). The results are supported by 2 year dermal carcinogenic studies indicate only dermal effects are likely (EMBSI, 2005; Mobil, 2001; Kane *et al*, 1984; BP, 1991; Mobil, 1991).

Aspiration: RAE substances span a range of viscosities with values reported as >2000 mm²/s at 40°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Samples of RAE substances have been tested in acute studies with fish and Daphnia. Results show the LL50 was >1000 mg/l for fish and Daphnia (BP, 1994a; BP, 1994b).

To assess the impact on alga a PETROTOX QSAR prediction was used, with an EL_{50} (72h) of >1000 mg/l based on growth rate (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Samples of RAE substances have been tested in 21-day *Daphnia magna* reproduction toxicity tests, and the EL_{50} was >1000 mg/l (BP, 1995).

Environmental fate (biodegradation / bioaccumulation): RAE substances are hydrocarbon UVCBs. Based on the known or expected properties of individual constituents, RAE substances are not predicted to be readily biodegradable but are inherently biodegradable. Constituents of RAE substances show measured or predicted values for $\log K_{ow} \geq 4$ and are considered potentially bioaccumulative.

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.

Labelling

Signal word: Warning

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H351: Suspected of causing cancer.

Precautionary statements:

P201: Obtain special instructions before use.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

P273: Avoid release to the environment

P391: Collect spillage

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1986) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-16 light paraffinic distillate solvent extract (CAS 64742-05-8). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 33-31226. Washington DC: American Petroleum Institute

ARCO (1983) Acute inhalation toxicity study in rats administered test article F-30-02 (CAS 64742-04-7). Study conducted by Bio-Research Laboratories Ltd. Study No. 81677. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1996) Comparison of biological and chemical predictors of dermal carcinogenicity of petroleum oils. *Polycyclic Aromatic Compounds* 11, 201-210

BP (1991) 1156, 1157 and 1158: 2-year skin painting study. Report No. 25-90-0275. Surrey UK: BP Group Occupational Health Centre

BP (1994a) The acute toxicity of PSG 1857 to *Daphnia magna*. Study conducted by Safepharm Laboratories Ltd. Report No. 599/43. Brussels: BP Oil Europe

BP (1994b) The acute toxicity of PSG 1857 to rainbow trout (*Oncorhynchus mykiss*). Study conducted by Safepharm Laboratories Ltd. Report No. 599/44. Brussels: BP Oil Europe

BP (1995) Assessment of the effect of PSG 1857 on the reproduction of *Daphnia Magna*. Study conducted by Safepharm Laboratories Ltd. Report No. 692/6. Brussels: BP Oil Europe

Charles River (2021a) The Alkaline in vivo Comet Assay with Aromatic Extract (CAS number 91995-70-9) in Liver, Duodenum and Glandular Stomach of Wistar Han Rats (study report). Study number: 20277075

Charles River (2021b) The Alkaline in vivo Comet Assay with Residual Aromatic Extract (CAS number 64742-10-5) in Liver, Duodenum, Glandular Stomach of Wistar Han Rats (study report). Study number: 20277076

Charles River (2021c) A 90-Day Study of Residual Aromatic Extract (CAS number 64742-10-5) by Dietary Administration in Wistar Han Rats (study report). Study number: 20268315

Charles River (2021d) A 90-Day Study of Residual Aromatic Extract (CAS number 91995-70-9) by Dietary Administration in Wistar Han Rats (study report). Study number: 20268313

Charles River (2021e) Prenatal Developmental Toxicity Study of Residual Aromatic Extract (CAS number 64742-10-5) by Dietary Administration in Time-Mated Wistar Han Rats (study report). Study number: 20268322

Charles River (2021f) Prenatal Developmental Toxicity Study of Residual Aromatic Extract (CAS number 91995-70-9) by Dietary Administration in Time-Mated Wistar Han Rats (study report). Study number: 20268320

CIT (2001) *In vitro* mammalian cell gene mutation test in L5178Y TK⁺ mouse lymphoma cells. EXAROL 50. Study conducted for TOTALFINA. Study No. 20837 MLY. Evreux: Centre International de Toxicologie

Concawe (2012) Use of the modified Ames test as an indicator of the carcinogenicity of residual aromatic extracts. Report No. 12/12. Brussels: Concawe

EBSI (1997a) Microbial mutagenesis in *Salmonella* mammalian microsome preincubation assay using DMSO extraction modification. MRD-96-657 brightstock extract. Study conducted for Esso Italiana S.A. Report No. 165725. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1997b) Microbial mutagenesis in *Salmonella* mammalian microsome preincubation assay using DMSO extraction modification. MRD-96-601 brightstock extract. Study conducted for Exxon Company International. Report No. 160125. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2005) Two year dermal carcinogenicity study in mice. Test substances MRD-96-596, MRD-96-597, MRD-96-598, MRD-96-599, MRD-96-601, MRD-96-657, MRD-96-661. EMBSI Environ. Toxicol. & Chem. Lab. Report No. 159611. Fairfax VA: ExxonMobil Lubricants & Petroleum Specialties

Institut Pasteur de Lille (2000) Détermination de l'activité mutagène du produit EXAROL 50 par le test d'Ames modifié appliqué à des produits pétroliers. Report No. IPL-R 001101. Study conducted for TOTAL. Lille: Institut Pasteur de Lille

Kane, M.L. *et al* (1984) Toxicological characteristics of refinery streams used to manufacture lubricating oils. *Am J Ind Med* 5, 3, 183-200

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week dermal administration of four bright stock extracts (BSEs) to rats. Mobil Environ. and Health Sci. Lab. Study No. 62239, 62260, 62261, 62262. Princeton NJ: Mobil Oil Corporation

Mobil (1991) Dermal carcinogenicity studies for samples 62274, 62273, 62216, 62215, 62157, 62246, 62271 and 62272 (SM-190 - SM-197). Study conducted by University of Cincinnati Medical Center, Department of Environmental Health. Princeton NJ: Mobil Oil Corporation

Mobil (2001) Dermal carcinogenicity of refined petroleum streams. Study conducted by Kettering Laboratory. Study No. 67746. Fairfax VA: Mobil Business Resources Corporation

PetroLabs (1998a) Modified Ames testing of one oil sample from Mobil Corporation. PLI Study No. 98056. Ivyland PA: Petrolabs Inc.

PetroLabs (1998b) Modified Ames testing of one oil sample from Mobil Corporation. PLI Study No. 98043. Ivyland PA: Petrolabs Inc.

Petrolabs (1998c) Modified Ames testing of ten oil samples from Mobil Corporation. PLI Study No. 98026. Ivyland PA: Petrolabs Inc.

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

8.16. SLACK WAXES (SLACKWAX)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the melting point range and the carbon number range as follows:

- Derived from vacuum distilled fractions and separated as a semi-solid by chilling
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - hydrotreatment / hydrodesulphurisation
 - solvent extraction
 - chilling

N-B.: some category members are subject to further intermediate processing such as de-oiling or treatment with acid, clay, active carbon or hydrogenation but without changing their hydrocarbon composition significantly.

- Hydrocarbon types: The major components of all slack waxes are branched and straight chain paraffins and naphthenes (cycloparaffins), which normally account for at least 85% by volume of a wax process stream. Aromatic hydrocarbons, mainly alkylbenzenes and alkylnaphthalenes will not normally exceed 15% by volume of slack wax streams. The boiling points of hazardous, 3 to 7 fused-ring polycyclic aromatic hydrocarbons (PAHs) are in the boiling range of the petroleum waxes, but they are removed by solvent extraction before chilling and wax separation.
- Typical melting point range: predominantly 43 °C to 76 °C
- Typical boiling point range: predominantly 300 °C to 800 °C
- Typical carbon number range: predominantly C₁₂ to C₁₂₀

Appendix 1 lists only those Slackwax substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Slackwax substances are solids.

Flammable Aerosol: Not relevant - Slackwax substances are solids.

Flammable Liquid: Not relevant - Slackwax substances are solids.

Flammable Solid: Slackwax substances do not meet the requirement for classification as a flammable solid.

Oxidising Gas: Not relevant - Slackwax substances are solids.

Oxidising Liquid: Not relevant - Slackwax substances are solids.

Oxidising Solid: Slackwax substances are not considered oxidising based on structural considerations.

Pyrophoric Liquid: Not relevant - Slackwax substances are solids.

Pyrophoric Solid: Slackwax substances do not spontaneously ignite in contact with air.

Self-reactive Substance: Slackwax substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Slackwax substances do not react exothermically.

Gas under Pressure: Not relevant - Slackwax substances are solids.

Organic Peroxide: Slackwax substances do not meet the definition of a peroxide.

Corrosive to Metal: Slackwax substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Slackwax substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Slackwax substances have been tested in acute oral and dermal studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982; API, 1986b)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1982; API, 1986b)

Skin Corrosion / Irritation: Slackwax substances from carcinogenic or unknown feed stock were tested in rabbit skin irritation studies (API, 1986b). Studies were conducted with a non-guideline 24 hour test with occlusive dressing. If a 4 hour test with semi-occlusive dressing was conducted the material would not be expected to be irritating to skin. A Slackwax substance from non-carcinogenic feed stock was tested in human volunteers and showed no evidence of irritation (EBSI, 1988). There was no evidence of irritation or corrosion.

Serious Eye Damage / Irritation: Eye irritation potential of a Slackwax substance (from carcinogenic or unknown feed stock) was evaluated in rabbits. Based on the results, the material is not considered to be an eye irritant (API, 1986b). Read-across from a “sufficiently refined” LBO substance showed no evidence of irritation indicating that Slackwax substances from non-carcinogenic feedstock are not irritating to the eye (API, 1982).

Respiratory or Skin Sensitization: No studies were available for respiratory sensitization. For skin sensitisation, a Slackwax substance from carcinogenic or unknown feed stocks was evaluated by read-across and determined to be non-sensitising (API, 1986b). For Slackwax substances from a non-carcinogenic feed stock, read-across studies from LBO substances indicate that dermal sensitization was not observed (API, 1982; EBSI, 1988).

Germ Cell Mutagenicity: Samples of Slackwax substances produced mixed results in *in vitro* assays. In *in vivo* assays the samples did not produce any clastogenetic effects in the mouse micronucleus assay. Based on the available data, Slackwax substances are not considered to be germ cell mutagens (Blackburn *et al*, 1984; Blackburn *et al*, 1986; PetroLabs, 2004; API, 1986d; API, 1986c; ARCO, 1987a; ARCO, 1987b; Przygoda *et al*, 1999; McKee, 1990).

Carcinogenicity: The carcinogenic potential of Slackwax substances is determined by the feedstock from which the Slackwax substance is derived. Based on the available data, studies with Slackwax substances from insufficiently refined feedstock were carcinogenic, while those from sufficiently refined feedstocks were not (Smith *et al*, 1951; Kane *et al*, 1984).

Reproductive Toxicity: The reproductive toxicity potential of Slackwax substances is determined by the feedstock from which the Slackwax substance is derived. For Slackwax substances from non-carcinogenic feed-stock, a key read-across screening study indicated no reproductive or developmental effects. An additional developmental toxicity study showed no effects (WIL Research Laboratories, 1995; Mobil, 1987). For Slackwax substances derived from carcinogenic feedstock a read-across study from UDAE substances indicates developmental effects are likely (Mobil, 1989).

Specific Target Organ Toxicity

Single Exposure: Acute exposure studies show no specific organ toxicity following single exposure to slack waxes (API, 1982; API, 1986b).

Repeated Exposure: The repeat dose toxicity of Slackwax substances from carcinogenic or unknown feed stocks was assessed using read-across. Results indicate that oral and dermal exposure is likely to result in target organ toxicity (adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus) (Mobil, 1990; Chasey and McKee, 1993). For Slackwax substances from non-carcinogenic feed-stocks, dermal repeat dose read-across studies showed no evidence of target organ toxicity (Mobil, 1983; API, 1986a; API, 1987; EBSI, 1991).

Aspiration: Viscosity of Slackwax substances at 40°C is not determined and in most cases the melting point is above this temperature. Viscosity for Slackwax substances ranges from 2.2 to 30 mm²/s at 100°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: All acute aquatic toxicity studies with fish, invertebrates and algae on samples of Slackwax substances (read-across from LBO substances) show acute toxicity values greater than 100 mg/l. These tests were carried out on water accommodated fractions (EBSI, 1995; Petro-Canada, 2008; Croucher, and Girling, 1988). Supporting acute toxicity QSAR predictions for fish, invertebrates and algae show toxicity above 1000 mg/l (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on samples of Slackwax substances (reading across from LBO substances) show chronic toxicity values greater than 1 mg/l for invertebrates. These tests were carried out on water accommodated fractions (Girling, 1995). A supporting QSAR prediction for chronic fish toxicity is greater than 1000 mg/l (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): Slackwax substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Slackwax substances show predicted values for log K_{ow} ranging from 2 to greater than 6 and are therefore considered potentially bioaccumulative. (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.

Hazard class	Hazard category	Hazard statement
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal route.

Labelling

Signal word: Warning

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal route.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982) Acute toxicity tests of API 78-9 paraffinic oil, nominal viscosity 70 SUS/100°F (CAS 64742-56-9). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33104. Washington DC: American Petroleum Institute

API (1986a) 28-day dermal toxicity study in the rabbit of API 84-01. Light paraffinic distillate (CAS 64741-50-0). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 33-31642. Washington DC: American Petroleum Institute

API (1986b) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 84-01 light paraffinic distillate (CAS 64741-50-0). Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 33-30595. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 83-15, heavy naphthenic distillate (CAS 64742-52-5), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32800. Washington DC: American Petroleum Institute

API (1986d) Mutagenicity of API 84-01, light paraffinic distillate (CAS 64741-50-0), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32801. Washington DC: American Petroleum Institute

API (1987) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

ARCO (1987a) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0059. Los Angeles CA: ARCO

ARCO (1987b) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0054. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* 13, 1, 57-65

Croucher, E.A. and Girling, A.E. (1988) Oils: acute toxicity of four oils to *Daphnia magna* and *Gammarus pulex*. Report No. SBGR.88.075. Sittingbourne: Shell Research Ltd

EBSI (1988) Evaluation of the skin irritating and sensitizing propensities of MRD-88-289 in humans. Study conducted by Product Investigations Inc. Report No. PI-5338. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1991) Dermal carcinogenesis assay in C₃H/HeNCrLBR mice. Report prepared for Exxon Company USA. EBSI Study No. 201111. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995) Fish, acute toxicity test. MRD-94-981 basestock solvent neutral 600. Report prepared for Exxon Company International. EBSI Study No. 198140. East Millstone NJ: Exxon Biomedical Sciences Inc.

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

Kane, M.L. *et al* (1984) Toxicological characteristics of refinery streams used to manufacture lubricating oils. *Am J Ind Med* 5, 3, 183-200

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

Petro-Canada (2008) 72-hour growth inhibition toxicity test report. *Pseudokirchneriella subcapitata*. Study performed by AquaTox Testing & Consulting Inc. Study No. 213706. Mississauga ON: Petro-Canada Research & Development

PetroLabs (2004) Modified Ames testing of four slack waxes from American Petroleum Institute. Report No. 04040. Ivyland PA: PetroLabs Inc.

Przygoda, R.T. *et al* (1999) Assessment of the utility of the micronucleus test for petroleum-derived materials. *Mutation Research* 438, 145-153

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Smith, W.E. *et al* (1951) Experimental analysis of the carcinogenic activity of certain petroleum products. *Arch Ind Hyg Occup Med* 4, 4, 299-314

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

8.17. PARAFFIN AND HYDROCARBON WAXES (PARAFFINWAX)

Definition / Domain: The domain of this category is established by the process by which the category members are produced, the predominant hydrocarbon classes present, the melting point range and the carbon number range as follows:

- Derived from vacuum distilled fractions and separated as a solid by chilling.
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - hydrotreatment / hydrodesulphurisation
 - solvent extraction
 - chilling

Note: some category members are subject to further processing such as de-oiling or treatment with acid, clay, active carbon or hydrogenation but without changing their hydrocarbon composition significantly.

- Hydrocarbon types: the major components of all paraffin and hydrocarbon waxes are branched and straight chain paraffins and naphthenes (cycloparaffins), which normally account for at least 85% by volume of a wax process stream. Aromatic hydrocarbons, mainly alkylbenzenes and alkylnaphthalenes will not normally exceed 15% by volume of paraffin and hydrocarbon wax streams. The boiling point range of paraffin and hydrocarbon waxes is such that components of specific toxicological concern such as benzene (boiling point 80°C) and n-hexane (boiling point 69°C) are typically not present. The boiling points of the hazardous, 3 to 7 fused-ring polycyclic aromatic hydrocarbons (PAHs) are in the boiling range of the paraffin and hydrocarbon waxes, but they are removed by solvent extraction before chilling and wax separation.
- Typical melting point range: predominantly 43°C to 95°C
- Typical boiling point range: predominantly 300°C to 800°C
- Typical carbon number range: predominantly C₁₂ to C₈₅

Appendix 1 lists only those Paraffinwax substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Paraffinwax substances are solids.

Flammable Aerosol: Not relevant - Paraffinwax substances are solids.

Flammable Liquid: Not relevant - Paraffinwax substances are solids.

Flammable Solid: Paraffinwax substances do not meet the requirement for classification as a flammable solid as the flash point is typically >160°C.

Oxidising Gas: Not relevant - Paraffinwax substances are solids.

Oxidising Liquid: Not relevant - Paraffinwax substances are solids.

Oxidising Solid: Not considered oxidising based on structural considerations.

Pyrophoric Liquid: Not relevant - Paraffinwax substances are solids.

Pyrophoric Solid: Paraffinwax substances do not spontaneously ignite in contact with air.

Self-reactive Substance: Paraffinwax substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Paraffinwax substances do not react exothermically.

Gas under Pressure: Not relevant - Paraffinwax substances are solids.

Organic Peroxide: Paraffinwax substances do not meet the definition of a peroxide.

Corrosive to Metal: Paraffinwax substances do not meet the requirement for corrosion to metal.

Substance which in contact with water emits flammable gas: Paraffinwax substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Paraffinwax substances have been tested in acute oral and dermal studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (SafePharm Laboratories, 2007a; IBR, 1976)
Rat dermal	LD ₅₀ > 2000 mg/kg _{bw} (BIBRA, 1993b)

Skin Corrosion / Irritation: Paraffinwax substances were tested in rabbit skin irritation studies under semi-occlusive conditions for 4 hours. Slight erythema was observed and was fully reversible by 24 hours (NOTOX, 2003). There was no evidence of skin corrosion.

Serious Eye Damage / Irritation: Eye irritation potential of a Paraffinwax substance was evaluated. Results indicate that the eye irritation that occurred had cleared within 24 hours. Based on the Draize scores, the material is not considered to be an eye irritant (SafePharm Laboratories, 2007b).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. For skin sensitization a Paraffinwax substance was evaluated in a guideline study and determined to be non-sensitising (Phycher Bio Développement, 2007).

Germ Cell Mutagenicity: Paraffinwax substances tested negative in *in vitro* assays (TNO, 2005a; TNO, 2005b; TNO, 2005c). *In vivo* assays for samples of Paraffinwax substances did not exhibit mutagenicity (McKee *et al*, 1990). Based on the available data, Paraffinwax substances are not considered to be germ cell mutagens.

Carcinogenicity: The carcinogenic potential of Paraffinwax substances was assessed in oral and dermal studies. The Paraffinwax substances were not considered to be carcinogenic (Shubik *et al*, 1962).

Reproductive Toxicity: Paraffinwax substances were assessed for fertility and developmental effects via read-across to “sufficiently refined” LBO substances. No reproductive toxicity was observed (WIL Research Laboratories, 1995; Mobil, 1987).

Specific Target Organ Toxicity

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to Paraffinwax substances (SafePharm Laboratories, 2007a; IBR, 1976; BIBRA, 1993b).

Repeated Exposure: The repeat dose toxicity of Paraffinwax substances was assessed for both oral and dermal routes of exposure either as the substance or as read-across from LBO substances. The study data indicate that no target organ toxicity was observed (BIBRA, 1993a; Worrell, 1992; Shubik *et al*, 1962; Mobil, 1983; API, 1987; EBSI, 1991).

Aspiration: Paraffinwax substances span a range of viscosities with values reported in the range 3 to 30 mm²/s at 100°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: All acute aquatic toxicity studies with fish, invertebrates and algae on samples of Paraffinwax substances (reading across from LBO substances) show acute toxicity values greater than 100 mg/l. These tests were carried out on water accommodated fractions. (EBSI, 1995; Petro-Canada, 2008; Croucher, E.A. and Girling, A.E., 1988). Supporting acute toxicity QSAR predictions for fish, invertebrates and algae show toxicity above 1000 mg/l (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on samples of Paraffinwax substances (reading across from LBO substances) show chronic toxicity values greater than 1 mg/l for invertebrates. These tests were carried out on water accommodated fractions (Girling, 1995). A supporting QSAR prediction for chronic fish toxicity is greater than 1000 mg/l (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): Paraffinwax substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Paraffinwax substances show predicted values for log K_{ow} ranging from 2 to greater than 6 and are therefore considered potentially bioaccumulative (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

Classification and labelling according to CLP / GHS

Paraffinwax substances are not classified.

REFERENCES

API (1987) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

BIBRA (1993a) A 90-day feeding study in the rat with two mineral waxes identified as paraffin wax 64 (OFH-064) and micro/paraffin wax mixture. Study conducted for European Wax Federation. BIBRA Report No. 1205/2/93. Surrey UK: BIBRA Toxicology International

BIBRA (1993b) An acute dermal toxicity limit test in the rat with SX30. Study conducted for Shell International Petroleum Mij. B.V. BIBRA Report No. 1091/2. Surrey UK: BIBRA Toxicology International

Croucher, E.A. and Girling, A.E. (1988) Oils: acute toxicity of four oils to *Daphnia magna* and *Gammarus pulex*. Report No. SBGR.88.075. Sittingbourne: Shell Research Ltd

EBSI (1991) Dermal carcinogenesis assay in C₃H/HeNCrIBR mice. Report prepared for Exxon Company USA. EBSI Study No. 201111. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995) Fish, acute toxicity test. MRD-94-981 basestock solvent neutral 600. Report prepared for Exxon Company International. EBSI Study No. 198140. East Millstone NJ: Exxon Biomedical Sciences Inc.

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

HydroQual (2010) PETRORISK Model. Prepared for Concawe

IBR (1976) Akute Toxizitätsprüfung von "R 9107" nach oraler Applikation an der Ratte. Report No. 1-4-195/1-76. Hannover: International Bio-Research Inc.

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

NOTOX (2003) Primary skin irritation/corrosion study with SX-50 (Sarawax 50) in the rabbit (4-hour semi-occlusive application). Report No. 393648. The Netherlands: NOTOX

Petro-Canada (2008) 72-hour growth inhibition toxicity test report. *Pseudokirchneriella subcapitata*. Study performed by AquaTox Testing & Consulting Inc. Study No. 213706. Mississauga ON: Petro-Canada Research & Development

Phycher Bio Développement (2007) Paraffin waxes (Fisher-Tropsch), full range, C15-50 - branched and linear. Skin sensitisation in the guinea pig Magnusson and Kligman maximisation method. Report No. 2041/0056. Study conducted for Shell International Gas Ltd. Cestas France: Phycher Bio Développement

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

SafePharm Laboratories (2007a) Paraffin waxes (Fischer-Tropsch), full range, C15-50 - branched and linear. Acute oral toxicity in the rat - fixed dose method. Report No. 2041/0050. Study conducted for Shell International Gas Ltd. Derbyshire UK: SafePharm Laboratories Ltd

SafePharm Laboratories (2007b) Paraffin waxes (Fischer-Tropsch), full range, C15-50 - branched and linear. Acute eye irritation in the rabbit. Report No. 2041/0055. Study conducted for Shell International Gas Ltd. Derbyshire UK: SafePharm Laboratories Ltd

Shubik, P. *et al* (1962) Studies on the toxicity of petroleum waxes. *Toxicol Applied Pharmacol* 4, Suppl. 1, 1-62

TNO (2005a) Bacterial reverse mutation test with extract of Sasolwax 5203. Report No. V 6205/12. Study conducted for European Wax Federation. Zeist, The Netherlands: TNO

TNO (2005b) Chromosomal aberration test with Sasolwax 5203 in cultured Chinese hamster ovary (CHO) cells. Report No. V 6202/11. Study conducted for European Wax Federation. Zeist, The Netherlands: TNO

TNO (2005c) Gene mutation test at the TK-locus of L5178Y cells with Sasolwax 5203. Report No. V 6203/08. Study conducted for European Wax Federation. Zeist, The Netherlands: TNO

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

Worrell, N.R. (1992) A 90-day feeding study in the rat with six different mineral oils (N15(H), N70(H), N70(A), P15(H), N10(A) and P100(H)), three different mineral waxes (a low melting point wax, a high melting point wax and a high sulphur wax) and coconut oil. BIBRA Report No. 1010/3/92. Study conducted for Concawe. Surrey UK: BIBRA Toxicology International

8.18. **FOOTS OILS (FOOTSOIL)**

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present and the carbon number range as follows:

- Derived from crude petroleum which is refined by atmospheric and vacuum distillation
- Refinery processes
 - acid treatment (sulphuric or silicic acid)
 - clay treatment
 - de-oiling of slack waxes
 - activated carbon
- Hydrocarbon types: aromatics, paraffins, naphthenics
- Typical carbon number range: predominantly C₂₀ to C₅₀

Appendix 1 lists only those Footsoil substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Footsoil substances are liquids.

Flammable Aerosol: Not relevant - Footsoil substances are not in aerosol form.

Flammable Liquid: Footsoil substances typically have flash points >98°C (read-across to LBO substances).

Flammable Solid: Not relevant - Footsoil substances are liquids.

Oxidising Gas: Not relevant - Footsoil substances are liquids.

Oxidising Liquid: Footsoil substances are not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - Footsoil substances are liquids.

Pyrophoric Liquid: Footsoil substances do not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - Footsoil substances are liquids.

Self-reactive Substance: Footsoil substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Footsoil substances do not react exothermically.

Gas under Pressure: Not relevant - Footsoil substances are liquids.

Organic Peroxide: Footsoil substances do not meet the definition of a peroxide.

Corrosive to Metal: Footsoil substances are liquids and do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Footsoil substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Footsoil substances have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1986a; UBTL, 1983a)
Rat inhalation	LC ₅₀ > 5.53 mg/l (EBSI, 1988)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1986a)

Skin Corrosion / Irritation: Samples of Footsoil substances have been tested in rabbit skin irritation studies. The majority of the data were derived using a 24 hour occluded exposure protocol. The read-across study performed on “insufficiently refined” LBO substances showed moderate irritation. The study was performed for 24 hours rather than 4 hours and consequently the result from a shorter exposure time is not likely to cause irritation. In read-across studies on “sufficiently refined” LBO substances no irritation was observed. There was no evidence of skin corrosion (API, 1986a; API, 1982).

Serious Eye Damage / Irritation: The effects of samples of Footsoil substances on the eye have been investigated in rabbits using a number of samples. All of the samples tested were non-irritating to the eyes (API, 1986a; API, 1982).

Respiratory or Skin Sensitization: Tests in guinea pig with samples of Footsoil substances showed no evidence of skin sensitization (API, 1986a). There are no reports available to indicate a potential to cause respiratory sensitization.

Germ Cell Mutagenicity: Data were read-across from LBO substances. The mutagenic potential has been extensively studied in a range of *in vivo* and *in vitro* assays. The majority of the studies showed no evidence of mutagenic activity (Blackburn *et al*, 1984; Blackburn *et al*, 1986; API, 1986d; API, 1986c; ARCO, 1987; Przygoda *et al*, 1999; McKee, *et al*, 1990). Based on the available data, Footsoil substances are not considered to be germ cell mutagens.

Carcinogenicity: The carcinogenic potential of samples of Footsoil substances has been investigated in animals following dermal exposure. Based on these findings, Footsoil substances similar to “insufficiently refined” LBO substances are carcinogenic while those that are similar to “sufficiently refined” LBO substances are not carcinogenic (Doak *et al*, 1983; Chasey and McKee, 1993).

Reproductive Toxicity: There are no reproductive toxicity data available for Footsoil substances. Data were derived from LBO substances. Results of developmental and reproductive toxicity studies on “sufficiently refined” LBO substances did not show any evidence of developmental or reproductive toxicity in rats (WIL Research Laboratories, 1995; Mobil, 1987). There are two robust 2-generation reproductive studies (OECD 416) conducted with gas-to liquid products, a gas oil and a base oil (Boogaard *et al*, 2017). The gas oil contains branched and linear C8-C25 distillates and the base oil C18-C50 branched cyclic and linear distillates; these results indicate that the long chain hydrocarbons also present in Footsoil oils are not associated with reproductive toxicity as there were no effects on fertility or reproductive function. For the carcinogenic Footsoil substances, there are no data on fertility but based on evidence from repeated dose toxicity studies, no effects on reproductive organs are expected (Boogaard *et al*, 2017). Insufficiently refined footsoil oils are classified as carcinogenic (Carc 1B; H350) and reprotoxic (Repr 2; H361d).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies with samples of Footsoil substances show no evidence of systemic toxicity (API, 1982; API, 1986b; API, 1987).

Repeated Exposure: The repeat dose toxicity of samples of Footsoil substances has been investigated by dermal and inhalation routes for periods between 4 weeks and up to 2 years by read-across to LBO substances. For “insufficiently refined” LBO substances, read-across subchronic studies performed on UDAE substances resulted in specific target organ toxicity in the following tissues: adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus (Mobil, 1990; Chasey and McKee, 1993; API, 1986a). For “sufficiently refined” LBO substances,

repeat dose inhalation and dermal studies showed no systemic effects (Dalbey *et al.*, 1991; Mobil, 1983; EBSI, 1991).

Aspiration: Samples of Footsoil substances span a range of viscosities with values reported as >2 mm²/s at 40 °C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: All acute aquatic toxicity studies with fish, invertebrates and algae on samples of Footsoil substances (reading across from LBO substances) show acute toxicity values greater than 100 mg/l. These tests were carried out on water accommodated fractions (EBSI, 1995; Petro Canada, 2008; Croucher and Girling, 1988). Supporting acute toxicity QSAR predictions for fish, invertebrates and algae show toxicity above 1000 mg/l (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on a Footsoil substance (reading across from LBO substances) show chronic toxicity values greater than 1 mg/l for invertebrates. These tests were carried out on water accommodated fractions (Girling, 1995). A supporting QSAR prediction for chronic fish toxicity is greater than 1000 mg/l (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): Footsoil substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable (Girling, 1995). Constituents of Footsoil substances show predicted values for log K_{ow} ranging from 2 to greater than 6 and are therefore considered potentially bioaccumulative (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard

Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)Response:P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982) Acute toxicity tests of API 78-10 Paraffinic oil, nominal viscosity 150 SUS/100°F (CAS. 64742-56-0). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33105. Washington DC: American Petroleum Institute

API (1986a) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 83-12 hydrotreated light naphthenic distillate (CAS 64742-53-6). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 33-30592. Washington DC: American Petroleum Institute

API (1986b) 28-day dermal toxicity study in the rabbit of API 83-12. Hydrotreated light naphthenic distillate (CAS 64742-53-6). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 33-30499. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 83-15, heavy naphthenic distillate (CAS 64742-52-5), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32800. Washington DC: American Petroleum Institute

API (1986d) Mutagenicity of API 83-12, hydrotreated light naphthenic distillate (CAS 64742-53-6), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32802. Washington DC: American Petroleum Institute

API (1987) Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 83-12 hydrotreated light naphthenic distillate. Study conducted by Hazleton Laboratories America Inc. API Health Environ. Sci. Dep. Rep. 34-32775. Washington DC: American Petroleum Institute

ARCO (1987) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0059. Los Angeles CA: ARCO

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified Salmonella mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Boogaard, P.J. *et al* (2017) Toxicological and ecotoxicological properties of gas-to-liquid (GTL) products. 1. Mammalian toxicology, *Critical Reviews in Toxicology*, 47:2, 121-144, DOI: 10.1080/10408444.2016.1214676

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* 13, 1, 57-65

Croucher, E.A. and Girling, A.E. (1988) Oils: acute toxicity of four oils to *Daphnia magna* and *Gammarus pulex*. Report No. SBGR.88.075. Sittingbourne: Shell Research Ltd

Dalbey, W. *et al* (1991) Four-week inhalation exposures of rats to aerosols of three lubricant base oils. *J Appl Toxicol* 11, 4, 297-302

Doak, S.M.A. *et al* (1983) The carcinogenic potential of twelve refined mineral oils following long-term topical application. *Br J Cancer* 48, 429-436

EBSI (1988) Four hour acute inhalation toxicity study in rats. MRD-87-102. EBSI Study No. 210215. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1991) Dermal carcinogenesis assay in C₃H/HeNCrIBR mice. Report prepared for Exxon Company USA. EBSI Study No. 201111. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995) Fish, acute toxicity test. MRD-94-981 basestock solvent neutral 600. Report prepared for Exxon Company International. EBSI Study No. 198140. East Millstone NJ: Exxon Biomedical Sciences Inc.

EMBSI (2012) *Daphnia magna*, reproduction test. MRD-08-383 foots oil #1. Study performed for Concawe. EMBSI Study No. 0834746. Annandale NJ: ExxonMobil Biomedical Sciences Inc.

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

Petro-Canada (2008) 72-hour growth inhibition toxicity test report. *Pseudokirchneriella subcapitata*. Study performed by AquaTox Testing & Consulting Inc. Study No. 213706. Mississauga ON: Petro-Canada Research & Development

Przygoda, R.T. *et al* (1999) Assessment of the utility of the micronucleus test for petroleum-derived materials. *Mutation Research* 438, 145-153

Redman, A. and Yadav, B. (2010) Aquatic Toxicity Predictions Obtained Using the PETROTOX Model for petroleum substances (grey literature), Concawe, Brussels, Belgium

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

8.19. PETROLATUMS (PETROLATUM)

Definition / Domain: The domain of this category is established by the process by which the category members are produced, the predominant hydrocarbon classes present, the melting point range and the carbon number range as follows:

- Derived from vacuum distilled fractions and separated as a solid by chilling.
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - hydrotreatment / hydrodesulphurisation
 - solvent extraction
 - chilling

***Note:** some category members are subject to further intermediate processing such as de-oiling or treatment with acid, clay, active carbon or hydrogenation but without changing their hydrocarbon composition significantly.*

- Hydrocarbon types: the major components of all paraffin and hydrocarbon waxes are branched and straight chain paraffins and naphthenes (cycloparaffins), which normally account for at least 85% by volume of a wax process stream. Aromatic hydrocarbons, mainly alkylbenzenes and alkylnaphthalenes will not normally exceed 15% by volume of paraffin and hydrocarbon wax streams. The boiling point range of paraffin and hydrocarbon waxes is such that components of specific toxicological concern such as benzene (boiling point 80°C) and n-hexane (boiling point 69°C) are typically not present. The boiling points of the hazardous, 3 to 7 fused-ring polycyclic aromatic hydrocarbons (PAHs) are in the boiling range of the paraffin and hydrocarbon waxes, but they are removed by solvent extraction before chilling and wax separation.
- Typical melting point range: predominantly 43°C to 95°C
- Typical boiling point range: predominantly 300°C to 800°C
- Typical carbon number range: predominantly C₁₂ to C₈₅

Appendix 1 lists only those Petrolatum substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Petrolatum substances are solids.

Flammable Aerosol: Not relevant - Petrolatum substances are solids.

Flammable Liquid: Not relevant - Petrolatum substances are solids.

Flammable Solid: Petrolatum substances typically have flash points > 160°C.

Oxidising Gas: Not relevant - Petrolatum substances are solids.

Oxidising Liquid: Not relevant - Petrolatum substances are solids.

Oxidising Solid: Not considered oxidising based on structural considerations.

Pyrophoric Liquid: Not relevant - Petrolatum substances are solids.

Pyrophoric Solid: Petrolatum substances do not spontaneously ignite in contact with air.

Self-reactive Substance: Petrolatum substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Petrolatum substances do not react exothermically.

Gas under Pressure: Not relevant - Petrolatum substances are solids.

Organic Peroxide: Petrolatum substances do not meet the definition of a peroxide.

Corrosive to Metal: Petrolatum substances do not meet the criteria the requirement for corrosion of metal.

Substance which in contact with water emits flammable gas: Petrolatum substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Petrolatum substances have been tested in acute oral and dermal studies. Results indicate the following:

Rat oral	LD ₅₀ >5000 mg/kg _{bw} (API, 1982; API, 1986b)
Rabbit dermal	LD ₅₀ >2000 mg/kg _{bw} (BIBRA, 1993b; API, 1986b)

Skin Corrosion / Irritation: Samples of Petrolatum substances were evaluated in rabbit skin irritation studies. Results indicate that the material is not considered irritating to skin. There was no evidence of skin corrosion (API, 1986b; NOTOX, 2003).

Serious Eye Damage / Irritation: Samples of Petrolatum substances were evaluated in rabbit eye irritation studies. Results indicate that the material is not considered irritating to eye (API, 1986b; SafePharm Laboratories, 2007).

Respiratory or Skin Sensitization: No studies were located for respiratory sensitization. Samples of Petrolatum substances were evaluated for skin sensitization in the guinea pig and were shown to be non-sensitizing (API, 1986b; Kuhn, 1995).

Germ Cell Mutagenicity: The mutagenicity for Petrolatum substances was assessed. *In vitro* assays gave mixed results depending on the degree of refining. *In vivo* assays were negative in the mouse micronucleus assay (Blackburn *et al*, 1984; Blackburn *et al*, 1986; TNO, 2005a; API, 1986c; TNO, 2005b; ARCO, 1987; TNO, 2005c; Mobil, 1987b; McKee *et al*, 1990). Based on the available data, Petrolatum substances are not considered to be a germ cell mutagen.

Carcinogenicity: The carcinogenic potential of Petrolatum substances is determined by the feedstock from which the Petrolatum substance is derived. Based on the available data, Petrolatum substances from insufficiently refined feedstock are carcinogenic, while material from sufficiently refined feedstocks are not carcinogenic (Kane *et al*, 1984; Lijinsky *et al*, 1966; Oser *et al*, 1965; Blackburn *et al*, 1984).

Reproductive Toxicity: The reproductive toxicity potential of Petrolatum substances is determined by the feedstock from which the Petrolatum substance is derived. For Petrolatum substances from sufficiently refined feed-stock, read-across studies indicated no reproductive toxicity (WIL Research Laboratories, 1995; Mobil, 1987a). For Petrolatum substances derived from insufficiently refined feedstock a read-across study indicates developmental effects are likely (Mobil, 1989).

Specific Target Organ Toxicity

Single Exposure: Acute exposure studies do not indicate any specific organ toxicity following single exposure to Petrolatum substances (API, 1982; API, 1986b; BIBRA, 1993b).

Repeated Exposure: The repeat dose toxicity of insufficiently refined Petrolatum substances was assessed by read-across to similar substances. Results indicate that oral and dermal exposure could result in target organ toxicity (adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach and thymus) (Mobil, 1990; Mobil, 1989; API, 1986a; Chasey and McKee, 1993). For sufficiently refined Petrolatum substances, dermal and oral repeat dose read-across studies indicate no biologically significant target organ toxicity (Worrell, 1992; BIBRA, 1993a; Oser *et al*, 1965; Mobil, 1983; API, 1987; EBSI, 1991).

Aspiration: Petrolatum substances span a range of viscosities with values reported as 3 to 30 mm²/s at 100°C.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: All acute aquatic toxicity studies with fish, invertebrates and algae for Petrolatum substances (reading across from LBO substances) show acute toxicity values greater than 100 mg/l. These tests were carried out on water accommodated fractions (EBSI, 1995; Petro-Canada, 2008; Croucher and Girling, 1988). Supporting acute toxicity QSAR predictions for fish, invertebrates and algae show toxicity above 1000 mg/l (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: Chronic aquatic toxicity studies on samples of Petrolatum substances (reading across from LBO substances) show a lowest chronic toxicity value of 3 mg/l for invertebrates. These tests were carried out on water accommodated fractions (Girling, 1995). A supporting QSAR prediction for chronic fish toxicity is greater than 1000 mg/l (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): Petrolatum substances are hydrocarbon UVCBs. Based on compositional information available and measured or predicted data, key constituents are not expected to meet the criteria for ready degradability but are inherently biodegradable. Constituents of Petrolatum substances show predicted values for log K_{ow} ranging from 2 to greater than 6 and are considered potentially bioaccumulative (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the ‘worst-case’ C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). **Appendix 6** lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982) Acute toxicity tests of API 78-9 paraffinic oil, nominal viscosity 70 SUS/100°F (CAS 64742-56-9). Study conducted by Elars Bioresearch Laboratories Inc. API Med. Res. Publ. 29-33104. Washington DC: American Petroleum Institute

API (1986a) 28-day dermal toxicity study in the rabbit of API 84-01. Light paraffinic distillate (CAS 64741-50-0). Study conducted by Tegeris Laboratories Inc. API Med. Res. Publ. 33-31642. Washington DC: American Petroleum Institute

API (1986b) Acute oral toxicity study in rats. Acute dermal toxicity study in rabbits. Primary dermal irritation study in rabbits. Primary eye irritation study in rabbits. Dermal sensitization study in guinea pigs. API 84-01 light paraffinic distillate (CAS 64741-50-0). Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 33-30595. Washington DC: American Petroleum Institute

API (1986c) Mutagenicity of API 84-01, light paraffinic distillate (CAS 64741-50-0), in a mouse lymphoma mutation assay. Study conducted by Litton Bionetics Inc. API Med. Res. Publ. 33-32801. Washington DC: American Petroleum Institute

API (1987) 28-day dermal toxicity study of API 83-15, hydrotreated heavy naphthenic distillate (CAS 64742-52-5), in the rabbit. Study conducted by Tegeris Laboratories Inc. API Health Environ. Sci. Dep. Rep. 35-32430. Washington DC: American Petroleum Institute

ARCO (1987) Evaluation of chromosome aberrations in Chinese hamster ovary (CHO) cells. Study conducted by Microbiological Associates Inc. ARCO Study No. ATX-85-0059. Los Angeles CA: ARCO

BIBRA (1993a) A 90-day feeding study in the rat with two mineral waxes identified as paraffin wax 64 (OFH-064) and micro/paraffin wax mixture. Study conducted for European Wax Federation. BIBRA Report No. 1205/2/93. Surrey UK: BIBRA Toxicology International

BIBRA (1993b) An acute dermal toxicity limit test in the rat with SX30. Study conducted for Shell International Petroleum Mij. B.V. BIBRA Report No. 1091/2. Surrey UK: BIBRA Toxicology International

Blackburn, G.R. *et al* (1984) Estimation of the dermal carcinogenic activity of petroleum fractions using a modified Ames assay. *Cell Biology and Toxicology* 1, 1, 67-80

Blackburn, G.R. *et al* (1986) Predicting carcinogenicity of petroleum distillation fractions using a modified *Salmonella* mutagenicity assay. *Cell Biology and Toxicology* 2, 1, 63-84

Chasey, K.L. and McKee, R.H. (1993) Evaluation of the dermal carcinogenicity of lubricant base oils by the mouse skin painting bioassay and other proposed methods. *J Appl Toxicol* 13, 1, 57-65

Croucher, E.A. and Girling, A.E. (1988) Oils: acute toxicity of four oils to *Daphnia magna* and *Gammarus pulex*. Report No. SBGR.88.075. Sittingbourne: Shell Research Ltd

EBSI (1991) Dermal carcinogenesis assay in C₃H/HeNCrIBR mice. Report prepared for Exxon Company USA. EBSI Study No. 201111. East Millstone NJ: Exxon Biomedical Sciences Inc.

EBSI (1995) Fish, acute toxicity test. MRD-94-981 basestock solvent neutral 600. Report prepared for Exxon Company International. EBSI Study No. 198140. East Millstone NJ: Exxon Biomedical Sciences Inc.

Girling, A.E. (1995) Lubricant base oil LVIN 38: chronic toxicity of water-accommodated fractions to *Daphnia magna*. Report No. SBGR.94.099. Sittingbourne: Shell Research Ltd

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

Kane, M.L. *et al* (1984) Toxicological characteristics of refinery streams used to manufacture lubricating oils. *Am J Ind Med* 5, 3, 183-200

Kuhn, J.O. (1995) Dermal sensitization study in guinea pigs. 4531 pet blend white USP. Study conducted for Penzoil Products Company. Study No. 1588-94. Sugar Land TX: STILLMEADOW Inc.

Lijinsky, W. *et al* (1966) Skin tumorigenesis by an extract of amber petrolatum. *Toxicol Applied Pharmacol* 8, 1, 113-117

McKee, R.H. *et al* (1990) An evaluation of the genotoxic potential of mineral hydrocarbons. *Environ Molecular Mutagen* 15, Suppl. 17, 41

Mobil (1983) Thirteen-week toxicity study by dermal application of metalworking fluid components to rats. Mobil Environ. and Health Sci. Lab. Study No. 1451-81. Princeton NJ: Mobil Oil Corporation

Mobil (1987a) 100 SUS solvent refined base oil developmental toxicity screen in rats. Mobil Environ. and Health Sci. Lab. Study No. 51841. Princeton NJ: Mobil Oil Corporation

Mobil (1987b) Micronucleus assay of bone marrow red blood cells from rats treated for thirteen weeks with 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 61738. Princeton NJ: Mobil Oil Corporation

Mobil (1989) Developmental toxicity study in rats exposed dermally to 318 isthmus furfural extract. Mobil Environ. and Health Sci. Lab. Study No. 62884. Princeton NJ: Mobil Oil Corporation

Mobil (1990) Thirteen-week administration of 318 isthmus furfural extract to rats. Mobil Environ. and Health Sci. Lab. Study No. 61737. Princeton NJ: Mobil Oil Corporation

NOTOX (2003) Primary skin irritation/corrosion study with SX-50 (Sarawax 50) in the rabbit (4-hour semi-occlusive application). Report No. 393648. The Netherlands: NOTOX

Oser, B.L. *et al* (1965) Toxicologic studies of petrolatum in mice and rats. *Toxicol Applied Pharmacol* 7, 382-401

Petro-Canada (2008) 72-hour growth inhibition toxicity test report. *Pseudokirchneriella subcapitata*. Study performed by AquaTox Testing & Consulting Inc. Study No. 213706. Mississauga ON: Petro-Canada Research & Development

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

SafePharm Laboratories (2007) Paraffin waxes (Fischer-Tropsch), full range, C15-50 - branched and linear. Acute eye irritation in the rabbit. Report No. 2041/0055. Study conducted for Shell International Gas Ltd. Derbyshire UK: SafePharm Laboratories Ltd

TNO (2005a) Bacterial reverse mutation test with extract of Sasolwax 5203. Report No. V 6205/12. Study conducted for European Wax Federation. Zeist The Netherlands: TNO

TNO (2005b) Chromosomal aberration test with Sasolwax 5203 in cultured Chinese hamster ovary (CHO) cells. Report No. V 6202/11. Study conducted for European Wax Federation. Zeist The Netherlands: TNO

TNO (2005c) Gene mutation test at the TK-locus of L5178Y cells with Sasolwax 5203. Report No. V 6203/08. Study conducted for European Wax Federation. Zeist The Netherlands: TNO

WIL Research Laboratories (1995) An oral reproduction/developmental toxicity screening study of OLOA 219 in finished oils in rats. Study conducted for Chevron Research and Technology Company. Study No. WIL-187007. Ashland OH: WIL Research Laboratories Inc.

Worrell, N.R. (1992) A 90-day feeding study in the rat with six different mineral oils (N15(H), N70(H), N70(A), P15(H), N10(A) and P100(H)), three different mineral waxes (a low melting point wax, a high melting point wax and a high sulphur wax) and coconut oil. BIBRA Report No. 1010/3/92. Study conducted for Concawe. Surrey UK: BIBRA Toxicology International

8.20. BITUMENS (BITUMEN)

Definition / Domain: The domain of this category is established by the process by which the category members are produced, the predominant hydrocarbon classes present, the melting point range and the carbon number range as follows:

- Derived from crude petroleum.
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - solvent deasphalting
 - thermal cracking
- Hydrocarbon types: predominantly asphaltenes (MW 2,000 to 5,000) and maltenes (MW 500 to 2,000) with small amounts of lower weight materials, including polycyclic aromatic hydrocarbons (PAHs).
- Typical boiling point range greater than 320°C to more than 500°C
- Typical carbon number range: predominantly greater than C₂₅ but with the bulk of the material having carbon numbers greater than C₅₀ and up to C₈₀

Appendix 1 lists only those Bitumen substances with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Bitumen substances are solids.

Flammable Aerosol: Not relevant - Bitumen substances are not in aerosol form.

Flammable Liquid: Bitumen substances are high molecular weight hydrocarbon solids.

Flammable Solid: Bitumen substances have flash points are greater than 180°C.

Oxidising Gas: Not relevant - Bitumen substances are solids.

Oxidising Liquid: Not relevant - Bitumen substances are solids. They are not considered oxidising based on structural considerations.

Oxidising Solid: Bitumen substances are solids. They are not considered oxidising based on structural considerations.

Pyrophoric Liquid: Not relevant - Bitumen substances are solids. They do not spontaneously ignite in contact with air.

Pyrophoric Solid: Bitumen substances do not spontaneously ignite in contact with air.

Self-reactive Substance: Bitumen substances are not self-reactive. They do not undergo exothermic decomposition when heated.

Self-heating Substance: Bitumen substances do not react exothermically.

Gas under Pressure: Not relevant - Bitumen substances are solids.

Organic Peroxide: Bitumen substances do not meet the definition of a peroxide.

Corrosive to Metal: Bitumen substances do not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Bitumen substances do not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Bitumen substances have been tested in acute oral and dermal studies. Results show the following:

Sprague-Dawley rat, oral : LD₅₀ > 5000 mg/kg_{bw} (API, 1982a; API, 1982b)

New Zealand White rabbit, dermal : LD₅₀ > 2000 mg/kg_{bw} (API, 1982a; API, 1982b)

Sprague-Dawley rat, inhalation: LC₅₀ (4.5hrs) > 94.4mg/m³ (read-across from Oxidized Asphalt; Fraunhofer, 2000a)

This is a read-across inhalation study, as no acute inhalation toxicity data is available for straight-run bitumen. Fumes from OxiAsph (aerosol and vapour) have been tested. Read across from oxidized asphalt to straight run bitumen is considered valid since mild oxidation is not expected to change the composition or acute toxicity of the material. Additionally, repeated dose toxicity studies on bitumen and oxidized asphalt support that bitumens are not acutely hazardous. Therefore, bitumens are not classified as acutely toxic under CLP ((EC) No. 1272/2008) criteria (EU, 2008).

Skin Corrosion / Irritation: Samples of Bitumen substances have been tested in rabbit skin irritation studies, performed under occlusion and during 24 hours, rather than 4 hour semi-occluded exposure recommended by current OECD guidelines. Only minimal, transient irritation was seen (API, 1982a; API, 1982b). Mean erythema and oedema scores over the 72 hour period were low. Consequently, the result from a shorter exposure time will not meet the criteria for classification.

Serious Eye Damage / Irritation: The effects of Bitumen substances on the eye have been investigated in rabbits. None of the samples tested showed more than minimal redness and swelling, which resolved quickly (API, 1982a; API, 1982b).

Respiratory or Skin Sensitization: Tests in guinea pigs with samples of Bitumen substances showed no evidence of skin sensitization (API, 1983a, API, 1983b). There is no data available for respiratory sensitisation for bitumen.

Germ Cell Mutagenicity: The mutagenic potential of Bitumen substances and fume condensates from Bitumen substances has been extensively studied in a range of *in vivo* and *in vitro* assays. It is important to recognize that toxicity studies involving exposure to fume or fume condensates from bitumens represent only the volatile fraction of the whole material. Overall, there is no convincing evidence from studies in animals that exposure to fumes from bitumen causes mutagenic or clastogenic effects (Kriech *et al*, 2007; De Meo *et al*, 1996; Qian, *et al*, 1996; Bottin *et al*, 2006; Micillino *et al*, 2002, API 1984 a,b). The available data does not provide clear consistent evidence of genotoxic activity. Chronic inhalation studies with oxidized (air-rectified) asphalt, (Halter *et al*, 2007) together with comparative fume composition information, indicate that read across to the bitumen category, is appropriate. Based on these *in vivo* animal studies, it clearly is shown that bitumen-induced DNA adducts are not necessarily linked to mutagenic effects.

In addition, no consistent association was observed between acute and chronic clinical effects on lung function or respiratory irritation following exposure to bitumen fumes in additional human studies (Gamble *et al*, 1999; Watkins, 2002; Burstyn *et al*, 2003; Randem *et al*, 2003; Breuer *et al*, 2011; Marczynski *et al*, 2011; Pesch *et al*, 2011; Raulf-Heimsoth *et al*, 2001a,b,c; Rihs *et al*, 2011; Spickenheuer *et al*, 2011; Welge, 2011).

Based on the currently available data, bitumens are unlikely to be mutagenic and do not meet the criteria for classification under CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Furthermore, a testing proposal has been submitted according to the OECD Guideline 474 (in vivo mammalian somatic cell study) in combination with a study OECD Guideline 489 (In vivo Mammalian Alkaline Comet Assay), subject to approval following ECHA/MSCA review.

Carcinogenicity: The carcinogenic potential of Bitumen substances and fumes from Bitumen substances has been investigated in animals following dermal and inhalation exposure routes with no clear evidence of carcinogenic effects (Clark *et al*, 2011; Goyak *et al*, 2011; Fraunhofer, 2006; Hueper and Payne, 1960; Simmers, 1965; Robinson *et al*, 1984; Wallcave *et al*, 1971; Fuhst *et al*, 2006). In addition, two epidemiological studies examining European asphalt workers were identified with no conclusion on the presence or absence of a causal link between exposure to bitumen fume and cancer risk (IARC, 2001; IARC, 2009). Overall, the data available does not indicate that exposure to Bitumen substances or fumes from Bitumen substances present a carcinogenic hazard under normal condition of use.

Reproductive Toxicity:

Effects on fertility : A testing proposal for extended one-generation study for reproductive toxicity (OECD guideline 443) has been included in the registration dossiers submitted to ECHA and is subject to approval following ECHA/MSCA review

Developmental toxicity: A developmental inhalation study on bitumen has been performed in rats via the inhalation route as this is considered the only relevant route of human exposure (Fraunhofer, 2017). The NOAEC is 150mg/m³ with no adverse effects observed. Currently available data do not raise concern with regard to classification of bitumen as toxic for reproduction or development under EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1982a; API, 1982b; Fraunhofer, 2000b).

Repeated Exposure: The repeat dose toxicity of Bitumen substances has been investigated by dermal and inhalation routes. Apart from mild irritation of the upper respiratory tract there is no evidence that exposure to Bitumen substances or fumes from Bitumen substances causes significant systemic toxicity (Fraunhofer, 2001; API, 1983c; API, 1983d).

In addition, Concawe believes that dermal is the most relevant exposure route. However, the primary objective of the testing required for REACH is the identification of hazard, for which the default exposure route under the regulation is oral as this is considered to maximise systemic exposure. To address the regulatory exposure route issue, Concawe plans to also conduct a number of oral OECD 422 studies on prioritized substances in each relevant petroleum category.

Aspiration: Not relevant as Bitumen substances are solid.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: There is no data available on the acute aquatic toxicity of Bitumen substances. Bitumen substances are not expected to exert acute toxicity based on water solubility limitations. QSAR assessment, based on their hydrocarbon composition, indicates that they would be expected to give LL50 (96 hrs) values > 1000 mg/l for fish, daphnia and algae (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: There is no chronic toxicity data available for Bitumen substances. QSAR assessment of chronic toxicity, based on hydrocarbon composition, indicates that they would be expected to give chronic NOEL(28 days) values in fish and daphnia of ≥ 1000 mg/l (Redman and Yadav, 2010).

The bitumen substances do not raise concern regarding hazards to the environment according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Environmental fate (biodegradation/ bioaccumulation): Bitumen substances are hydrocarbon UVCBs and therefore biodegradation tests are not applicable. These endpoints are characterized using quantitative structure property relationships for representative hydrocarbon structures that comprise the hydrocarbon blocks used to assess the environmental risk with the PETRORISK model. Based on compositional information available and measured or predicted data on key constituents (Howard *et al*, 2010), Bitumen substances are not expected to meet the criteria for ready degradability.

Calculated BCF for constituents of these substances range between 0.4 and 13300 l/kg and are considered potentially bioaccumulative (Software tool EPISuite v.4.10; BCFBAF, 2012).

Part 2 - Summary of Classification and Labelling Recommendations

Classification and labelling according to CLP / GHS

Bitumen substances are not classified under EU CLP ((EC) No. 1272/2008) (EU, 2008).

REFERENCES

API (1982a) Acute toxicity studies of vacuum residuum. API 81-13. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31987. Washington DC: American Petroleum Institute

API (1982b) Acute toxicity studies of vacuum residuum. API 81-14. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31989. Washington DC: American Petroleum Institute

API (1983a) Dermal sensitization study in guinea pigs closed patch technique vacuum residuum. API 81-13. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31415. Washington DC: American Petroleum Institute

API (1983b) Dermal sensitization study in guinea pigs closed patch technique vacuum residuum. API 81-14. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31416. Washington DC: American Petroleum Institute

API (1983c) 28-day dermal toxicity study in the rabbit. API 81-13 vacuum residuum. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32852. Washington DC: American Petroleum Institute

API (1983d) 28-day dermal toxicity study in the rabbit. API 81-14 vacuum residuum. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32853. Washington DC: American Petroleum Institute

API (1984a) Mutagenicity evaluation studies in the rat bone marrow cytogenetic assay and in the mouse lymphoma forward mutation assay API 81-13 vacuum residuum. Study conducted by Litton Bionetics. API Med. Res. Publ. 31-30614. Washington DC: American Petroleum Institute

API (1984b) Mutagenicity evaluation studies in the rat bone marrow cytogenetic assay and in the mouse lymphoma forward mutation assay API 81-14 vacuum residuum. API Med. Res. Publ. 31-30615. Washington DC: American Petroleum Institute

Burstyn I, Boffetta P, et al. (2003) Estimating exposures in the asphalt industry for an International epidemiological cohort study of cancer risk. *American Journal of Industrial Medicine* 43, 1, 3-17

BCFBAF (2012): BCFBAF v3.01 (Computer model). Based on Meylan, W.M. et al. (1999): Improved Method for Estimating Bioconcentration / Bioaccumulation Factor from Octanol/Water Partition Coefficient. *Environ. Toxicol. Chem.* 18, 4, 664-672 (1999)

Bottin, M.C. *et al* (2006) Genotoxic effects of bitumen fumes in Big Blue® transgenic rat lung. *Mutation Research* 596, 91-105

Breuer D *et al.* (2011) Air sampling and determination of vapours and aerosols of bitumen and polycyclic aromatic hydrocarbons in the Human Bitumen Study. *Archives of Toxicology* 85 (Suppl 1), S11-S20

Clark, C.R. *et al* (2011) Asphalt fume dermal carcinogenicity potential: I. dermal carcinogenicity evaluation of asphalt (bitumen) fume condensates. *Regul. Toxicol. Pharmacol* 61, 9-16

De Meo, M. *et al* (1996) *In vitro* studies of the genotoxic effects of bitumen and coal-tar fume condensates: comparison of data obtained by mutagenicity testing and DNA adduct analysis by ³²P-postlabelling. *Chemico-Biological Interactions* 101, 73-88

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 and as further amended

Fraunhofer (2000a). 14-Day dose range finding inhalation study of bitumen fumes in Wistar (WU) rats. Report No. 02N00515. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research

Fraunhofer (2000b) Acute inhalation toxicity study of 100 mg/m bitumen fumes in Wistar (WU) rats. Report No. 02G00012. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research

Fraunhofer (2001). 13 weeks inhalation toxicity study of bitumen fumes in Wistar (WU) rats. Report No. 02G01005. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research

Fraunhofer (2006) Twenty-four month inhalation carcinogenicity study of bitumen fumes in Wistar (WU) - rats. Report No. 02G03003. Study conducted for ARBIT. Hannover: Fraunhofer Institute of Toxicology and Experimental Medicine

Fraunhofer (2017): Prenatal Developmental Toxicity Study with Bitumen Fumes in Crl:Wistar (Han) Rats (study report), Testing laboratory: Fraunhofer Institute for Toxicology and Experimental Medicine (Fraunhofer ITEM), Nikolai-Fuchs-Str.1, 30625 Hannover, Germany, Report no: Fraunhofer ITEM Study No. 12G16011. Owner company; Concawe, Report date: Feb 14, 2018.

Fuhst *et al.* (2006) 24 months inhalation carcinogenicity study of bitumen fumes in Wistar (WU) rats. *J Occup Environ Hyg* 4 (S1), 20-43

Gamble J.F. *et al.* (1999) Exposure-response of asphalt fumes with changes in pulmonary function and symptoms. *Scandinavian Journal of Work, Environment & Health* 25, 3, 186-206

Goyak, K. O. *et al* (2011) Paving asphalt products exhibit a lack of carcinogenic and mutagenic activity. *Int J Toxicol* 30, 5, 492-497

Halter R, *et al* (2007) Importance of DNA - adduct formation and gene expression profiling of disease candidate genes in rats exposed to bitumen fumes (publication), *Journal of Occupational and Environmental Hygiene*, 4 (S1), 44-64

Howard *et al* (2010) BioHCWin v1.01a (Computer model), Howard, P.H., W.M., Meylan, Aronson, D., Stiteler, W.M., Tunkel, J., Comber, M. and Parkerton, F. 2005. A New Biodegradation Prediction Model Specific to Petroleum Hydrocarbons. *Environ. Toxicol. Chem.* 24(8): p1847-1860. workers. Lyon: International Agency for Research on Cancer

Hueper, W.C. and Payne, W.W. (1960) Carcinogenic studies on petroleum asphalt, cooling oil, and coal tar. *Archives of Pathology* 70, 372-384

IARC (2001) IARC epidemiological study of cancer mortality among European asphalt workers (study report)

IARC (2009) A case-control study of lung cancer nested in a cohort of European asphalt workers (publication), IARC. Report date: Jul 1, 2009

Kriech, A.J. *et al* (2007) Generation of bitumen fumes using two fume generation protocols and comparison to worker industrial hygiene exposures. *J Occup and Environ Hyg.* 4, *S1*, 6-19

Marczynski, B. *et al.* (2011) DNA adducts and strand breaks in workers exposed to vapours and aerosols of bitumen: associations between exposure and effect. *Archives of Toxicology* 85 (Suppl 1), S53-S64

Micillino, J.C. *et al* (2002) Lack of genotoxicity of bitumen fumes in transgenic mouse lung. *Toxicology* 170, 11-20

Pesch, B. *et al.* (2011) Urinary metabolites of polycyclic aromatic hydrocarbons in workers exposed to vapours and aerosols of bitumen. *Archives of Toxicology* 85 (Suppl 1), S29-S39

Qian, H.W. *et al* (1996) Induction of micronuclei in cultured mammalian cells by fume condensates of roofing asphalt. *Am J Ind Med* 29, 554-559

Randem, B.G. *et al.* (2003) Mortality from non-malignant diseases among male Norwegian asphalt workers. *American Journal of Industrial Medicine* 43, *1*, 96-103

Randem, B.G. *et al.* (2004) Respiratory symptoms and airflow limitation in asphalt workers. *Occupational and Environmental Medicine* 61, *4*, 367-369

Raulf-Heimsoth M. *et al.* (2011a) The Human Bitumen Study: executive summary. *Archives of Toxicology* 85 (Suppl 1), S3-S9

Raulf-Heimsoth, M. *et al.* (2011b) Irritative effects of vapours and aerosols of bitumen on the airways assessed by non-invasive methods. *Archives of Toxicology* 85 (Suppl 1), S41-S52

Raulf-Heimsoth, M. *et al.* (2011c) Bitumen workers handling mastic versus rolled asphalt in a tunnel: assessment of exposure and biomarkers of irritation and genotoxicity. *Archives of Toxicology* 85 (Suppl 1), S81-S87

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Rihs, H-P. *et al.* (2011) Modulation of urinary polycyclic aromatic hydrocarbon metabolites by enzyme polymorphisms in workers of the German Human Bitumen Study. *Archives of Toxicology* 85 (Suppl 1), S73-S79

Robinson, M. *et al.* (1984) Comparative carcinogenic and mutagenic activity of coal tar and petroleum asphalt paints used in potable water supply systems (publication), *J. App. Toxicol.* 4, *1*, 49-56

Simmers, M.H. (1965) Cancers In Mice From Asphalt Fractions (publication), *Industrial Medicine and Surgery*, 34: p573-577. Wallcave, L. *et al* (1971) Skin tumorigenesis in mice by petroleum asphalts and coal-tar pitches of known polynuclear aromatic hydrocarbon content. *Toxicol Applied Pharmacol* 18, 41-52.

Spickenheuer, A. *et al.* (2011) Levels and determinants of exposure to vapours and aerosols of bitumen. *Archives of Toxicology* 85 (Suppl 1), S21-S28

Wallcave, L. *et al* (1971) Skin tumorigenesis in mice by petroleum asphalts and coal-tar pitches of known polynuclear aromatic hydrocarbon content. *Toxicol Applied Pharmacol* 18, 41-52

8.21. ASPHALT (OXIASPH)

Definition / Domain: Oxidized asphalt is derived from crude petroleum. It is a complex black solid, obtained by blowing air through heated petroleum residues, or the raffinate from a deasphalting process with or without a catalyst. The process is principally one of oxidative condensation which increases the molecular weight.

- Derived from crude petroleum
- Refinery processes
 - atmospheric distillation
 - vacuum distillation
 - solvent deasphalting
 - thermal cracking
 - oxidation
- Hydrocarbon types: Predominantly asphaltenes (MW 2,000 to 5,000) and maltenes (MW 500 to 2,000) with small amounts of lower weight materials, including polycyclic aromatic hydrocarbons (PAHs).
- Typical boiling point range: Greater than 308 °C
- Typical carbon number range: Predominantly greater than C₂₅ but with the bulk of the material having carbon numbers greater than C₅₀ and up to C₈₀

As shown in **Appendix 1**, OxiAsph is defined by a single EC number (265-169-4).

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - OxiAsph is solid.

Flammable Aerosol: Not relevant - OxiAsph is not in aerosol form.

Flammable Liquid: OxiAsph is a high molecular weight hydrocarbon solid.

Flammable Solid: OxiAsph has flash point greater than 250 °C.

Oxidising Gas: Not relevant - OxiAsph is solid.

Oxidising Liquid: Not relevant - OxiAsph is solid. It is not considered oxidising based on structural considerations.

Oxidising Solid: OxiAsph is solid. It is not considered oxidising based on structural considerations.

Pyrophoric Liquid: Not relevant - OxiAsph is solid. It does not spontaneously ignite in contact with air.

Pyrophoric Solid: OxiAsph does not spontaneously ignite in contact with air.

Self-reactive Substance: OxiAsph is not self-reactive. It does not undergo exothermic decomposition when heated.

Self-heating Substance: OxiAsph does not react exothermically.

Gas under Pressure: Not relevant - OxiAsph is solid.

Organic Peroxide: OxiAsph does not meet the definition of a peroxide.

Corrosive to Metal: OxiAsph does not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: OxiAsph does not react with water.

1.2 Health Hazards

Read across from bitumen substances to oxidized asphalt, is justified based on the weight of evidence from all available studies and the fact that the oxidation process increases the molecular weight and is not expected to change the toxicity of the material.

Acute Toxicity: Samples of Bitumen substances have been tested in acute oral and dermal studies. Results show the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982a; API, 1982b)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1982a; API, 1982b)

Fumes from OxiAsph (aerosol and vapour) have been tested in an acute inhalation study and the 4hr LC₅₀ (rat) was > 94.4 mg/m³ (Fraunhofer, 2000a; Fraunhofer, 2000b). Read across toxicity studies have been conducted on straight-run asphalt to assess the acute oral and dermal hazard (API, 1982a; API 1982b). For all these endpoints oxidized asphalt is not acutely toxic.

Skin Corrosion / Irritation: Samples of Bitumen substances have been tested in rabbit skin irritation studies. The data were derived using a 24 hour occluded exposure protocol. Only minimal, transient irritation was seen (API, 1982a; API, 1982b).

Serious Eye Damage / Irritation: The effects of Bitumen substances on the eye have been investigated in rabbits. None of the samples tested showed more than minimal redness and swelling, which resolved quickly (API, 1982a; API, 1982b).

Respiratory or Skin Sensitization: Tests in guinea pigs with samples of Bitumen substances showed no evidence of skin sensitization. There are no reports available to indicate that OxiAsph has the potential to cause respiratory sensitization (API, 1983c; API, 1983d).

Germ Cell Mutagenicity: The mutagenic potential of Bitumen substances and fume condensates from Bitumen substances has been extensively studied in a range of *in vivo* and *in vitro* assays. Overall, there is no evidence that exposure to Bitumen substances or fumes from Bitumen substances causes mutagenic effects (Kriech *et al*, 2007; De Meo *et al*, 1996; Qian *et al*, 1996; Bottin *et al*, 2006; Micillino, *et al*, 2002; Fraunhofer, 2009). Based on the available data, OxiAsph is not considered to be a germ cell mutagen.

Carcinogenicity: The carcinogenic potential of OxiAsph and fumes from OxiAsph has been investigated in animals following dermal and inhalation exposure. In addition, epidemiological studies have been undertaken in exposed human populations. Based on the available information, OxiAsph is not considered to be a carcinogenic hazard and does not meet the criteria for classification as carcinogen (Clark *et al*, 2011; Freeman *et al*, 2011; Fraunhofer, 2006; Niemeier *et al*, 1985; Sivak *et al*, 1989; Sivak *et al*, 1997; Boffetta *et al*, 2001).

Reproductive Toxicity:

Developmental toxicity: One PNDT study (OECD 414) in which developmental effects of oxidised asphalt fume condensate was evaluated in rats. With no adverse effects seen in foetuses at the highest dose tested, the NOAEL was >500 mg/m³ (nominal) (Fraunhofer, 2018).

Reproductive toxicity: No comprehensive guideline 2-generation reproductive toxicity studies are available for oxidised asphalt. A PNDT study conducted according to OECD 414 and a screening reproductive/developmental toxicity study evaluating oxidised asphalt fume condensate showed no effects on reproductive or developmental parameters (Fraunhofer, 2018, 2009).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity. (API, 1982a; API, 1982b; Fraunhofer, 2001).

Repeated Exposure: The repeat dose toxicity of OxiAsph has been investigated by dermal and inhalation routes. Apart from mild irritation of the upper respiratory tract there is no evidence to suggest that exposure to OxiAsph causes systemic toxicity (Fraunhofer, 2006; API, 1983a; API, 1983b).

Aspiration: Not relevant as OxiAsph is solid.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: There are no data available on the acute aquatic toxicity of OxiAsph. QSAR assessment, based hydrocarbon composition, indicates that it would be expected to give LL50 values > 1000 mg/l for fish, daphnia and algae (Redman and Yadav, 2010).

Chronic (long-term) Aquatic Hazard: There are no chronic toxicity data available for OxiAsph. OxiAsph is not expected to exert chronic toxicity based on water solubility limitations. QSAR assessment of chronic toxicity, based on hydrocarbon composition, indicates that it would be expected to give chronic NOEL values in fish and daphnia of > 1000 mg/l. (Redman and Yadav, 2010).

Environmental fate (biodegradation / bioaccumulation): OxiAsph is a hydrocarbon UVCB. Based on compositional information available and measured or predicted data on key constituents, OxiAsph is not expected to meet the criteria for ready degradability. Constituents of Bitumen substances - which are expected to have similar environmental performance since the oxidation process is not changing the hazard profile - show predicted values for log K_{ow} ≥ 4 and are considered potentially bioaccumulative (HydroQual, 2010).

Part 2 - Summary of Classification and Labelling Recommendations

Classification and labelling according to CLP / GHS

OxiAsph is not classified.

REFERENCES

- API (1982a) Acute toxicity studies of vacuum residuum. API 81-13. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31987. Washington DC: American Petroleum Institute
- API (1982b) Acute toxicity studies of vacuum residuum. API 81-14. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31989. Washington DC: American Petroleum Institute
- API (1983a) 28-day dermal toxicity study in the rabbit. API 81-13 vacuum residuum. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32852. Washington DC: American Petroleum Institute
- API (1983b) 28-day dermal toxicity study in the rabbit. API 81-14 vacuum residuum. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32853. Washington DC: American Petroleum Institute
- API (1983c) Dermal sensitization study in guinea pigs closed patch technique vacuum residuum. API 81-13. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31415. Washington DC: American Petroleum Institute
- API (1983d) Dermal sensitization study in guinea pigs closed patch technique vacuum residuum. API 81-14. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31416. Washington DC: American Petroleum Institute
- Boffetta, P. *et al* (2001) IARC epidemiological study of cancer mortality among European asphalt workers. Internal Report 01/003. Lyon: International Agency for Research on Cancer
- Bottin, M.C. *et al* (2006) Genotoxic effects of bitumen fumes in Big Blue® transgenic rat lung. *Mutation Research* 596, 91-105
- Clark, C.R. *et al* (2011) Asphalt fume dermal carcinogenicity potential: I. dermal carcinogenicity evaluation of asphalt (bitumen) fume condensates. *Regul. Toxicol. Pharmacol* 61, 9-16
- De Meo, M. *et al* (1996) *In vitro* studies of the genotoxic effects of bitumen and coal-tar fume condensates: comparison of data obtained by mutagenicity testing and DNA adduct analysis by ³²P-postlabelling. *Chemico-Biological Interactions* 101, 73-88
- Fraunhofer (2000a). 14-Day dose range finding inhalation study of bitumen fumes in Wistar (WU) rats. Report No. 02N00515. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research
- Fraunhofer (2000b) Acute inhalation toxicity study of 100 mg/m bitumen fumes in Wistar (WU) rats. Report No. 02G00012. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research
- Fraunhofer (2001). 13 weeks inhalation toxicity study of bitumen fumes in Wistar (WU) rats. Report No. 02G01005. Hannover: Fraunhofer Institute of Toxicology and Aerosol Research
- Fraunhofer (2006) Twenty-four month inhalation carcinogenicity study of bitumen fumes in Wistar (WU) - rats. Report No. 02G03003. Study conducted for ARBIT. Hannover: Fraunhofer Institute of Toxicology and Experimental Medicine
- Fraunhofer (2009) Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test and mammalian erythrocyte micronucleus test via inhalation with roofing asphalt fume condensate. Report No. 02G08016. Study conducted for API. Hannover: Fraunhofer Institute of Toxicology and Experimental Medicine

Fraunhofer (2018): Prenatal Developmental Toxicity Study with Oxidized Asphalt Fumes in Crl:Wistar (Han) Rats (study report), Report no: 12G17009. Hannover: Fraunhofer Institute for Toxicology and Experimental Medicine (Fraunhofer ITEM). Owner company: Concawe

Freeman, J.J. *et al* (2011) Asphalt fume dermal carcinogenicity potential: II. Initiation-promotion assay of Type III built-up roofing asphalt. *Regul. Toxicol. Pharmacol.* 61, 1, 17-22
doi:10.1016/j.yrtph.2011.05.008

HydroQual (2010) PETRORISK Model. Prepared for Concawe. Mahwah NJ: HydroQual Inc.

Kriech, A.J. *et al* (2007) Generation of bitumen fumes using two fume generation protocols and comparison to worker industrial hygiene exposures. *J Occup and Environ Hyg.* 4, S1, 6-19

Micillino, J.C. *et al* (2002) Lack of genotoxicity of bitumen fumes in transgenic mouse lung. *Toxicology* 170, 11-20

Niemeier, R.W. *et al* (1985) A comparison of the skin carcinogenicity of condensed roofing asphalt and coal tar pitch fumes. In: Proc.10th international symposium on polynuclear hydrocarbons, p. 609-647. Columbus OH: Battelle Press

Qian, H.W. *et al* (1996) Induction of micronuclei in cultured mammalian cells by fume condensates of roofing asphalt. *Am J Ind Med* 29, 554-559

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Sivak, A. *et al* (1989) Assessment of the cocarcinogenic/promoting activity of asphalt fumes. Arthur D. Little Study No. 200-83-2612. Cincinnati OH: National Institute for Occupational Safety and Health

Sivak, A. *et al* (1997) Skin carcinogenicity of condensed asphalt roofing fumes and their fractions following dermal application to mice. *Cancer Letters* 117, 113-123

8.22. SULFUR (SULFUR)

Definition / Domain: Most sulfur is produced in de-sulfurisation processes of oil refinery streams, natural gas, gas from coke manufacture, synthesis gas or biogas, where the sulfur is extracted in the form of hydrogen sulfide which is subsequently converted to elemental sulfur. These processes provide sulfur in the form of a mono-constituent substance, i.e. with a concentration of 80% weight/weight or more. Some of these processes, such as the Claus process, yield sulfur with purity in excess of 99%.

As shown in **Appendix 1**, Sulfur is defined by a single EC number (231-722-6).

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - Sulfur is a solid.

Flammable Aerosol: Not relevant - Sulfur is not in aerosol form.

Flammable Liquid: Not relevant - Sulfur is a solid.

Flammable Solid: Not relevant - as Sulfur is an inorganic substance.

Oxidising Gas: Not relevant - Sulfur is a solid.

Oxidising Liquid: Not relevant - Sulfur is a solid.

Oxidising Solid: Not relevant - Sulfur is an inorganic substance which does not contain oxygen or halogen atoms.

Pyrophoric Liquid: Not relevant - Sulfur is a solid.

Pyrophoric Solid: Sulfur does not spontaneously ignite in contact with air.

Self-reactive Substance: Sulfur is not self-reactive. It does not undergo exothermic decomposition when heated.

Self-heating Substance: Sulfur does not react exothermically.

Gas under Pressure: Not relevant - Sulfur is a solid.

Organic Peroxide: Sulfur does not meet the definition of a peroxide.

Corrosive to Metal: Sulfur is solid and does not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: Sulfur does not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of Sulfur have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 2000 mg/(kg _{bw} *day) (Sandoz, 1994b)
Rat inhalation	LC ₅₀ > 5430 mg/m ³ air (TNO, 1994a)
Rabbit dermal	LD ₅₀ > 2000 mg/(kg _{bw} *day) (Sandoz, 1994a)

Skin Corrosion / Irritation: Sulfur was examined for acute dermal irritating/corrosive properties in the rabbit. The test material was irritating to the skin. Based on the available data, Sulfur is not expected to be corrosive (TNO, 1994b).

Serious Eye Damage / Irritation: The effects of Sulfur on the eye have been investigated in the rabbit. None of the samples tested showed more than minimal effects, which resolved within 72 hours (Rallis, 2005a; TNO, 1994c).

Respiratory or Skin Sensitization: Tests in guinea pigs showed no evidence of skin sensitization. These results together with extensive human experience indicate that Sulfur is not a dermal sensitizer (Advinus, 2005a; RCC and BRL, 1994a,b; Rallis, 2005e). There is no evidence to indicate that Sulfur is likely to be a respiratory sensitizer.

Germ Cell Mutagenicity: The mutagenic potential of Sulfur has been extensively studied in a range of *in vivo* and *in vitro* assays. These studies showed no evidence of mutagenic activity (Advinus, 2005b; Rallis, 2005b, c). Based on the available data Sulfur is not a germ cell mutagen.

Carcinogenicity: Sulfur is not expected to be carcinogenic based on no evidence of mutagenicity and a lack of structural alerts for mutagenicity/carcinogenicity. Furthermore, since Sulfur did not cause hyperplasia or pre-neoplastic lesions in the repeat dose toxicity study, it is unlikely that it will present a carcinogenic hazard to man (Advinus, 2006; Rallis, 2005d; Rallis, 2006).

Reproductive Toxicity: Based on weight of evidence approach, taking into account both dietary and occupational exposure in humans, its lack of mutagenic activity and its ubiquitous natural occurrence, Sulfur is unlikely to present a reproductive hazard to man (EPA, 1991).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (Sandoz 1994 a,b; TNO, 1994a).

Repeated Exposure: A repeat dose toxicity study of Sulfur has been studied in rats following dermal and oral exposure for periods between 28 days and 21 weeks. No systemic toxicity was observed; the only effect observed was local skin effects (Advinus, 2006; Rallis, 2005d; Rallis, 2006).

Aspiration: Not relevant as Sulfur is a solid.

1.3 Environmental Hazards

Acute (short-term) Aquatic Hazard: Acute toxicity studies in fish, Daphnia and algae show LC₅₀/EC₅₀ values at >5 µg/l (maximum water solubility) (IBACON, 2005 b, a, c).

Chronic (long-term) Aquatic Hazard: Sulfur is highly insoluble in water (water solubility < 5 µg/l) and is unlikely to present a chronic aquatic hazard.

Environmental fate (biodegradation / bioaccumulation): Biodegradation and bioaccumulation tests are not applicable for Sulfur as this substance is inorganic.

Part 2 - Summary of Classification and Labelling Recommendations

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Labelling

Signal word: Warning

Hazard pictogram:

GHS07: exclamation mark



Hazard statements:

H315: Causes skin irritation.

Precautionary statements:

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

Full list of Precautionary statements

Prevention:

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

REFERENCES

Advinus (2005a) Skin sensitisation study (Magnusson and Kligman test) with sulfur dust in guinea pigs. Study No. 4262/05. Bangalore, India: Advinus Therapeutics Private Ltd / Sulphur Task Force

Advinus (2005b) *In vitro* mammalian chromosome aberration test with sulfur dust. Study conducted by Advinus Therapeutics Private Ltd. Study No. 4266/05. Bangalore, India: Advinus Therapeutics Private Ltd

Advinus (2006) Sub-chronic (90 day) oral toxicity study by gavage with sulphur technical in Wistar rats. Study No. 4191/05. Bangalore, India: Advinus Therapeutics Private Ltd / Sulphur Mills

EPA (1991) Sulfur: reregistration eligibility decision (RED) fact sheet. United States Pesticides and 738-F-91-110 Environmental Protection. Washington DC: US Environmental Protection Agency

EPA (2009) Sulfur - human health risk scoping document in support of registration review. Document EPA-HQ-OPP-2008-0176-0012. Washington DC: US Environmental Protection Agency

IBACON (2005a) Acute toxicity of sulphur dust to *Daphnia magna* in a 48-hour immobilization test. . Report No. 23122220. Rossdorf, Germany: Institut für Biologische Analytik und Consulting IBACON GmbH / Sulphur Task Force

IBACON (2005b) Acute toxicity of sulphur dust to rainbow trout (*Oncorhynchus mykiss*) in a 96-hour semi static test. Report No. 23121230. Rossdorf, Germany: Institut für Biologische Analytik und Consulting IBACON GmbH / Sulphur Task Force

IBACON (2005c) Toxicity of sulphur dust to *Desmodesmus subspicatus* in an algal growth inhibition test. Report No. 23123210. Rossdorf, Germany: Institut für Biologische Analytik und Consulting IBACON GmbH / Sulphur Task Force

Rallis (2005a) Acute eye irritation/corrosion study with sulfur dust in New Zealand white rabbits. Study No. 4261/05. Bangalore India: Rallis India Ltd / Sulphur Mills Ltd

Rallis (2005b) Bacterial reverse mutation test with sulfur dust. Study No. 4265/05. Bangalore India: Rallis India Ltd / Sulphur Task Force

Rallis (2005c) Mammalian erythrocyte micronucleus test in Swiss albino mice with sulphur technical. Study No. 4192/05. Bangalore India: Rallis India Ltd / Sulphur Mills Ltd

Rallis (2005d) Repeated dose (28-day) oral toxicity study by gavage with sulfur dust in Wistar rats. Study No.4264/05. Bangalore, India: Rallis India Ltd / Sulphur Mills Ltd

Rallis (2005e) Skin sensitisation study (Magnusson and Kligman test) with sulphur 80% WG in guinea pigs. Study No. 4204/05. Bangalore India: Rallis India Ltd / Sulphur Mills Ltd

Rallis (2006) Repeated dose (28 day) dermal toxicity study with sulphur technical in Wistar rats. Study No. 4190/05. Bangalore, India: Rallis India Ltd / Sulphur Task Force

RCC and BRL (1994a) Contact hypersensitivity to SWPF (technical sulphur) in albino guinea pigs -maximization-test.. Report No. 362226. Itingen and Fuellinsdorf, Switzerland: Research and Consulting Company, Ltd and Biological Research Laboratories Ltd / Sulphur Working Group

RCC and BRL (1994b) Contact hypersensitivity to SWPF (technical sulphur) in albino guinea pigs -modified Buehler method. Report No. 365051. Itingen and Fuellinsdorf Switzerland: Research and Consulting Company, Ltd and Biological Research Laboratories Ltd / Sulphur Working Group

Sandoz (1994a) Sulfur technical: acute dermal toxicity study in rats. Report No. 536R. MuttENZ Switzerland: Sandoz Agro Ltd

Sandoz (1994b) Sulfur technical: acute oral toxicity study in rats. Report No. 535R. MuttENZ Switzerland: Sandoz Agro Ltd

TNO (1994a) Acute (4-hour) inhalation toxicity study with sulfur technical in rats. Report No. V94.137. Zeist, The Netherlands: TNO Nutrition and Food Research

TNO (1994b) Acute dermal irritation/corrosion study with sulfur technical in albino rabbits. Report No. V 94.064. Zeist, The Netherlands: TNO Nutrition and Food Research

TNO (1994c) Acute eye irritation/corrosion study with sulfur technical in albino rabbits. Report No. V 94.063. Zeist, The Netherlands: TNO Nutrition and Food Research.

8.23. RENEWABLE HYDROCARBONS (DEOXYGENATE DIESEL TYPE FRACTION - RENEWDD)

Definition / Domain: The domain of this category is established by the refining processes by which the category members are produced, the predominant hydrocarbon classes present, the boiling point range and the carbon number range as follows:

- Derived from renewable feedstocks.
- Refinery processes
 - atmospheric distillation
 - hydrotreatment / hydrodeoxygenation
- Hydrocarbon types: saturated
- Typical boiling point range: approximately 263°C ≤ 330.5°C
- Typical carbon number range: predominantly C₁₀ to C₂₉

Appendix 1 lists only those substance with active registrations at the time of issuing this report.

Part 1 - Classification Endpoint Rationale / Data Summary

1.1 Physical Hazards

Explosive: Not considered explosive, based on structural and oxygen balance considerations.

Flammable Gas: Not relevant - RenewDD is a liquid.

Flammable Aerosol: Not relevant - RenewDD is not in aerosol form.

Flammable Liquid: RenewDD is flammable liquid of variable flash point / initial boiling points.

Flammable Solid: Not relevant - RenewDD is a liquid.

Oxidising Gas: Not relevant - RenewDD is a liquid.

Oxidising Liquid: RenewDD is not considered oxidising based on structural considerations.

Oxidising Solid: Not relevant - RenewDD is a liquid.

Pyrophoric Liquid: RenewDD does not spontaneously ignite in contact with air.

Pyrophoric Solid: Not relevant - RenewDD is a liquid.

Self-reactive Substance: RenewDD is not self-reactive. It does not undergo exothermic decomposition when heated.

Self-heating Substance: RenewDD does not react exothermically

Gas under Pressure: Not relevant - RenewDD is a liquid.

Organic Peroxide: RenewDD does not meet the definition of a peroxide.

Corrosive to Metal: RenewDD is liquid and does not meet the criteria for corrosion of metal.

Substance which in contact with water emits flammable gas: RenewDD does not react with water.

1.2 Health Hazards

Acute Toxicity: Samples of hydrodesulfurised middle distillate have been tested in acute oral, dermal and inhalation studies. Results indicate the following:

Rat oral	LD ₅₀ > 5000 mg/kg _{bw} (API, 1982a; API, 1982b)
Rat inhalation (aerosol)	LC ₅₀ 4.6 mg/l (analytical) (API, 1983c)
Rabbit dermal	LD ₅₀ > 2000 mg/kg _{bw} (API, 1982a; API, 1982b)

The acute inhalation LC₅₀ for other gas oils for both male and female rats is 4.6 mg/L (aerosol) (OECD 403).

This is supported by a further study in which a hydrodesulphurised middle distillate gave an LC₅₀ of 7.64 mg/L (aerosol). In addition, a read-across study with a straight run gas oil gave an LC₅₀ of >2.53 mg/l.

For acute inhalation toxicity, the key study investigated the effects of hydrodesulfurised middle distillate in male and female Sprague Dawley rats exposed (whole body) to aerosol concentrations in the range of 0 - 7.3 mg/L for 4 hours (Klimisch score = 2, API, 1983). There were no reported mortalities during the 4hr exposure period, deaths occurring during the 14 day post-exposure observation period. Macroscopic and microscopic findings were limited to the lungs, where moderate to severe pulmonary irritation was apparent. Based on these results the LC50 for both males and females is 4.6 mg/L (aerosol) for other gas oils.

Skin Corrosion / Irritation: Samples of hydrodesulfurised middle distillate have been tested in rabbit skin irritation studies. The data were derived using a 24 and 72 hour occluded exposure protocol. The degree of dermal irritation observed was variable, variable values between 1.8 and 3.7, normally fully reversible within 14 days. There was no evidence of skin corrosion when applied to rabbit skin.

The data can be used without restriction for regulatory purposes and support classification of RenewDD as Skin Irritant 2 (H315) according to EU CLP Regulation.

Serious Eye Damage / Irritation: The effects of hydrodesulfurised middle distillate have been investigated into rabbits eyes using a number of samples. One of two studies undertaken on different samples of hydrodesulphurised middle distillates. Neither study produced significant ocular irritation.

Based on mild to moderate, transient and reversible eye irritation after exposure to hydrodesulfurised middle distillates, RenewDD does not meet the criteria for classification as an eye irritant according to the EU CLP Regulation.

Respiratory or Skin Sensitization: Tests in guinea pigs with hydrodesulfurised middle distillate showed no evidence of skin sensitization (API, 1984a,b). There are no reports available to indicate that Gasoline or other Naphtha streams have the potential to cause respiratory sensitization.

The data can be used without restriction for regulatory purposes and do not support classification as a sensitiser according to EU CLP Regulation.

Germ Cell Mutagenicity: The mutagenic potential of other gas oils has been extensively tested in both in vivo and in vitro tests. In vitro gene mutation assays in bacteria (modified) with

straight-run gas oils were predominantly negative and in vivo chromosome aberration assays were negative (May, 2013; McKee et al, 1994; Deininger et al., 1991).

Based on the evidence, RenewDD are unlikely to be mutagenic in humans and do not meet the criteria for classification as defined in EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Carcinogenicity: The carcinogenic potential of Hydrosulferized middle distillate and Straight run hydrotreated gas oil, has been investigated in mouse.

Frequent dermal application of a middle distillates (API 81-09 and 81-10) containing low levels of PACs to mouse skin produced skin tumours only if accompanied by moderate to marked skin irritation. A mechanism involving frequent cell damage and repair, rather than genotoxicity, has been proposed (API, 1989; Broddle, W.D., et al. (1996)).

Other Gas Oils have the potential to produce tumours via both genotoxic and non-genotoxic mechanisms. Utilising a worst case approach, Other Gas Oils should be classified as Category 1B carcinogens (H350) according to EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008) based on the information available on cracked gas oils. However, Note N has been assigned to this category in Annex VI of the CLP Regulation and the classification as a carcinogen need not apply if the full refining history is known and it can be shown that the substance from which it is produced is not carcinogenic.

Reproductive Toxicity: No reproductive toxicity data are available for other gas oils so there is insufficient information to classify this category as toxic for reproduction under the EU CLP Regulation (EC No. 1272/2008). An extended one-generation reproductive toxicity study is proposed for a representative sample of the category A key read-across developmental study on a sample of a straight run gas oil was identified.

The LOAEL for maternal toxicity was 50 mg/kg based on local dermal effects (ARCO, 1993a,b). The NOAEL for foetal toxicity was 50mg/kg (ARCO, 1993a,b). No classification for effects on development is proposed however since there was no evidence of foetal effects in the absence of significant maternal toxicity.

Results of guideline developmental toxicity studies on gasoline and OECD developmental toxicity screening studies with highly refined white oil showed no evidence of developmental toxicity in Sprague-Dawley rats (McKee et al, 1987). Similarly, studies in Sprague-Dawley rats did not show any effect on fertility performance (ARCO, 1994a; Mattie DR et al, 2000; Schreiner C et al, 1997).

Specific Target Organ Toxicity (STOT)

Single Exposure: Acute exposure studies show no evidence of systemic toxicity (API, 1982a, API 1983c).

Repeated Exposure: The NOAEC of > 1710 mg/m³ derived from the 90-day inhalation read-across study (Lock, S., Dalbey, W., Schmoyer, R., Griesemer, K. 1984) does not indicate classification according to the EU CLP criteria. Based on a NOAEL of 25 mg/kg/day in one 90-day dermal toxicity study (Mobil, 1985), and a LOAEL of 30 mg/kg/day from another 90 -day dermal toxicity study (Mobil, 1991), non carcinogenic RenewDD (see OIN 14) are not classified for repeat dose toxicity as H373 according to the EU CLP Regulation (EC No. 1272/2008).

Aspiration: RenewDD (like other gas oils) is low viscosity mobile hydrocarbon liquid with a viscosity at 40°C of $\leq 3.483 \text{ mm}^2/\text{s}$, meeting the classification criteria in CLP Regulation for aspiration hazard.

1.3 Environmental Hazards

Acute (short-term) Hazard: Acute aquatic toxicity studies on samples of RenewDD substance are not available; however suitable read-across information from other gas oils, vacuum gas oils, hydrocracked gas oils and distillate fuels is available.

These studies, carried out using the WAF (water accommodated fractions) methodology in closed systems to prevent evaporative loss, show acute toxicity values for fish, crustaceans and algae greater than 1 mg/l (Girling, A and Cann, B, 1996a,b).

The aquatic toxicity was estimated by a QSAR, the PETROTOX computer model (Redman and Yadav, 2010). Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition.

Chronic (long-term) Aquatic Hazard: There are no chronic toxicity studies available for RenewDD. The aquatic toxicity was estimated using the PETROTOX computer model, which combines a partitioning Model with the Target Lipid Model. The estimated freshwater fish NOEL (No Observed Effect Level) value is 0.069 mg/l based on mortality (Redman and Yadav, 2010).

The estimated fresh water invertebrate NOEL (No Observed Effect Level) value is 0.163 mg/l based on immobility (Redman and Yadav, 2010). RenewDD meet the criteria for classification as Toxic to aquatic life with long lasting effects (H411) according to the EU CLP Regulation ((EC) No. 1272/2008) (EU, 2008).

Environmental fate (biodegradation / bioaccumulation): RenewDD is hydrocarbon UVCB. Standard tests for biodegradation / bioaccumulation are intended for single substances and are not appropriate for complex substances.

They are characterized using quantitative structure property relationships for representative hydrocarbon structures that comprise the hydrocarbon blocks used to assess the environmental risk with the PETRORISK model. Suitable information that has been read across from the vacuum gas oils, hydrocracked oil and distillate fuels indicates that this category can be considered readily biodegradable.

Gas oils components have log K_{ow} values in the range 3.9 to greater than 6 and are likely to bioaccumulate. Calculated BCF for constituents of this substance range between 0.4 and 71100 L/kg (BCFBAF, 2012).

Part 2 - Summary of Classification and Labelling Recommendations

The information below represents the 'worst-case' C&L recommendation and must be used in the absence of information on certain relevant substance characteristics (C&L drivers). Appendix 6 lists all alternative C&L recommendations (C&L permutations) including OIN and/or CLP Notes, where applicable.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

Full list of Precautionary statements

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. — if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

REFERENCES

API (1982a) Acute toxicity studies of vacuum residuum. API 81-13. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31987. Washington DC: American Petroleum Institute

API (1982b) Acute toxicity studies of vacuum residuum. API 81-14. Study conducted by Hazleton Raltech Inc. API Med. Res. Publ. 30-31989. Washington DC: American Petroleum Institute

API (1983c) LC50 acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats. API 81-09 hydrodesulfurized middle distillate. Study conducted by International Research and Development Corporation. API Med. Res. Publ. 30-32856. Washington DC: American Petroleum Institute

API (1983) 28-day dermal toxicity study in the rabbit. API 81-10 hydrodesulfurized middle distillate. Study conducted by Borriston Laboratories Inc. API Med. Res. Publ. 30-32296. Washington DC: American Petroleum Institute

API (1984a) Dermal sensitization study in guinea pigs -closed patch technique. API 81-10 hydrodesulfurized middle distillate. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31414. Washington DC: American Petroleum Institute

API (1984b) Dermal sensitization study in guinea pigs -closed patch technique. API 81-09 hydrodesulfurized middle distillate. Study conducted by Hazleton Laboratories America Inc. API Med. Res. Publ. 31-31352. Washington DC: American Petroleum Institute

API (1989) Twenty-four month dermal carcinogenesis/chronic toxicity screening bioassay of refinery streams in C3H/HeJ mice. Study conducted by Primate Research Institute. API Health Environ. Sci. Dep. Rep. 36-33220. Washington DC: American Petroleum Institute

ARCO (1993a) Developmental toxicity (embryo -fetal toxicity and teratogenic potential) study of F-193 administered percutaneously to Crl:CD @BR VAF/Plus® presumed pregnant rats. Argus Study No. 1001-005. Los Angeles CA: ARCO

ARCO (1993b) Developmental toxicity (embryo -fetal toxicity and teratogenic potential) study of F-215 administered percutaneously to Crl: CD@BR VAF/Plus® presumed pregnant rats. Argus Study No. 1001-010. Los Angeles CA: ARCO

ARCO (1994a) A developmental toxicity screen in female Sprague-Dawley rats administered F-193 dermally during gestation days -7 to 20. UBTL Study No. 66353. Los Angeles CA: ARCO

Broddle, W.D., et al. (1996) Chronic dermal studies of petroleum streams in mice (publication), Fundamental and Applied Toxicology 30:47-54. Testing laboratory: Biology Department, Montana State University-Billings, 1500 North 30th Street, Billings, Montana 59101, Owner company; Conoco, Inc., 600 North Dairy Ashford Road, Houston, Texas, 77079

BCFBAF (2012): BCFBAF v3.01 (Computer model). Based on Meylan, W.M. et al. (1999): Improved Method for Estimating Bioconcentration / Bioaccumulation Factor from Octanol/Water Partition Coefficient. Environ. Toxicol. Chem. 18, 4, 664-672 (1999)

Deininger, G. et al (1991) Middle distillates: analytical investigations and mutagenicity studies. Report No. 412-1. Hamburg: DGMK.

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending

and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 (Initial CLP).

Girling, A.E. and Cann, B.J. (1996a) Gasoil sample 1: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40017. Thornton: Shell Research Ltd

Girling, A.E. and Cann, B.J. (1996b) Gasoil sample 2: acute toxicity of water accommodated fractions to *Oncorhynchus mykiss*, *Daphnia magna* and *Raphidocelis subcapitata*. Report No. OT.96.40018. Thornton: Shell Research Ltd

Lock, S., Dalbey, W., Schmoyer, R., Griesemer, K. (1984) Inhalation toxicology of diesel fuel obscurant in Sprague-Dawley rats, phase 3, subchronic exposures (study report), Testing laboratory: Oak Ridge National Laboratory, Oak Ridge, Tennessee, Report no: TM-9403. Owner company; U.S. Army Medical Research and Development.

Mattie, D.R. et al (2000) Reproductive effects of JP-8 jet fuel on male and female Sprague-Dawley rats after exposure by oral gavage. Study conducted by ManTech-Geo Centers Joint Venture. Report No. AFRL-HE-WP-TR-2000-0067. Wright Patterson Air Force Base OH: US Air Force Research Laboratory

May, K. (2013) 14 gas oils: bacterial reverse mutation test (ASTM E 1687). Study conducted for Concawe. Report No. PIM0002. Cambridgeshire: Huntingdon Life Sciences.

McKee, R.H. et al (1987) Developmental toxicity of EDS recycle solvent and fuel oil. Toxicology 46, 205-215

McKee, R.H. et al (1994) Evaluation of the genetic toxicity of middle distillate fuels. Environmental and Molecular Mutagenesis 23, 234-238.

Mobil (1985): Thirteen week dermal administration of light cycle oil to rats. (study report), Testing laboratory: Mobil Environmental and Health Science Laboratory, Princeton, NJ, Report no: 20535. Owner company; Mobil, Study number: 20535, Report date: Jul 3, 1985.

Mobil (1991): Thirteen-week dermal administration of beaumont coker light gas oil to rats (study report), Testing laboratory: Environmental and Health Sciences Laboratory, Princeton, New Jersey, Report no: 61996. Owner company; Concawe.

Redman, A. and Yadav, B. (2010) Aquatic toxicity predictions using the PETROTOX model for petroleum substance categories. Report prepared for Concawe. Mahwah NJ: HydroQual Inc.

Schreiner, C. et al (1997) Toxicity evaluation of petroleum blending streams: reproductive and developmental effects of hydrodesulfurized kerosine. J Toxicol Environ Health 52, 211-229

APPENDIX 1: LISTING OF UVCB HYDROCARBON SUBSTANCES

The tables below lists only those substances with active registrations at the time of issuing this report, with the following exceptions.

- Crude Oils are exempt from registration under REACH but still subject to notification under CLP.

UVCB hydrocarbon substances

CRUDE OILS		
EC #	CAS #	EC name
232-298-5	8002-05-9	Petroleum

LOW BOILING POINT NAPHTHAS (GASOLINES)		
EC #	CAS #	EC name
232-349-1	8006-61-9	Gasoline, natural
265-041-0	64741-41-9	Naphtha (petroleum), heavy straight-run
265-042-6	64741-42-0	Naphtha (petroleum), full-range straight-run
265-046-8	64741-46-4	Naphtha (petroleum), light straight-run
265-055-7	64741-54-4	Naphtha (petroleum), heavy catalytic cracked
265-056-2	64741-55-5	Naphtha (petroleum), light catalytic cracked
265-065-1	64741-63-5	Naphtha (petroleum), light catalytic reformed
265-066-7	64741-64-6	Naphtha (petroleum), full-range alkylate
265-068-8	64741-66-8	Naphtha (petroleum), light alkylate
265-070-9	64741-68-0	Naphtha (petroleum), heavy catalytic reformed
265-071-4	64741-69-1	Naphtha (petroleum), light hydrocracked
265-073-5	64741-70-4	Naphtha (petroleum), isomerization
265-075-6	64741-74-8	Naphtha (petroleum), light thermal cracked
265-079-8	64741-78-2	Naphtha (petroleum), heavy hydrocracked
265-085-0	64741-83-9	Naphtha (petroleum), heavy thermal cracked
265-086-6	64741-84-0	Naphtha (petroleum), solvent-refined light
265-089-2	64741-87-3	Naphtha (petroleum), sweetened
265-150-3	64742-48-9	Naphtha (petroleum), hydrotreated heavy
265-151-9	64742-49-0	Naphtha (petroleum), hydrotreated light
265-178-6	64742-73-0	Naphtha (petroleum), hydrodesulfurized light
265-185-4	64742-82-1	Naphtha (petroleum), hydrodesulfurized heavy
265-192-2	64742-89-8	Solvent naphtha (petroleum), light aliph.
265-199-0	64742-95-6	Solvent naphtha (petroleum), light arom.
270-660-4	68475-79-6	Distillates (petroleum), catalytic reformed depentanizer
270-686-6	68476-46-0	Hydrocarbons, C3-11, catalytic cracker distillates
270-690-8	68476-50-6	Hydrocarbons, C ₅ +5, C5-6-rich
270-695-5	68476-55-1	Hydrocarbons, C5-rich
270-993-5	68513-03-1	Naphtha (petroleum), light catalytic reformed, arom.-free
271-267-0	68527-27-5	Naphtha (petroleum), full-range alkylate, butane-contg.
271-635-0	68603-08-7	Naphtha (petroleum), arom
271-727-0	68606-11-1	Gasoline, straight-run, topping-plant
272-186-3	68783-12-0	Naphtha (petroleum), unsweetened
272-895-8	68919-37-9	Naphtha (petroleum), full-range reformed
272-931-2	68921-08-4	Distillates (petroleum), light straight-run gasoline fractionation stabilizer overheads
273-271-8	68955-35-1	Naphtha (petroleum), catalytic reformed

LOW BOILING POINT NAPHTHAS (GASOLINES)		
EC #	CAS #	EC name
285-510-3	85116-59-2	Naphtha (petroleum), catalytic reformed light, arom.-free fraction
289-220-8	86290-81-5	Gasoline
295-298-4	91995-38-9	Hydrocarbons, C4-6, depentanizer lights, arom. hydrotreater
295-331-2	91995-68-5	Extracts (petroleum), catalytic reformed light naphtha solvent
295-418-5	92045-37-9	Kerosine (petroleum), straight-run wide-cut
295-433-7	92045-52-8	Naphtha (petroleum), hydrodesulfurized full-range
295-440-5	92045-58-4	Naphtha (petroleum), isomerization, C6-fraction
295-441-0	92045-59-5	Naphtha (petroleum), light catalytic cracked sweetened
295-442-6	92045-60-8	Naphtha (petroleum), light, C5-rich, sweetened
295-445-2	92045-63-1	Hydrocarbons, C4-11, naphtha-cracking, arom.-free
295-446-8	92045-64-2	Hydrocarbons, C6-7, naphtha-cracking, solvent-refined
296-903-4	93165-19-6	Distillates (petroleum), C6-rich
297-401-8	93571-75-6	Aromatic hydrocarbons, C7-12, C8-rich
613-683-0	64741-72-6	Naphtha (petroleum), polymn.
614-725-0	68783-11-9	Naphtha (petroleum), light polymn.
940-595-2		Renewable hydrocarbons of vegetable oil and/or animal fat origin (naphtha type fraction)

KEROSES		
EC #	CAS #	EC name
232-366-4	8008-20-6	Kerosine (petroleum)
265-149-8	64742-47-8	Distillates (petroleum), hydrotreated light
265-184-9	64742-81-0	Kerosine (petroleum), hydrodesulfurized
265-198-5	64742-94-5	Solvent naphtha (petroleum), heavy arom.
294-799-5	91770-15-9	Kerosine (petroleum), sweetened

MK1 DIESEL FUEL		
EC #	CAS #	EC name
931-250-7	None	MK1 Diesel Fuel

STRAIGHT-RUN GAS OILS		
EC #	CAS #	EC name
265-043-1	64741-43-1	Gas oils (petroleum), straight-run
265-044-7	64741-44-2	Distillates (petroleum), straight-run middle
272-341-5	68814-87-9	Distillates (petroleum), full-range straight-run middle
272-817-2	68915-96-8	Distillates (petroleum), heavy straight-run

CRACKED GAS OILS		
EC #	CAS #	EC name
265-060-4	64741-59-9	Distillates (petroleum), light catalytic cracked
265-062-5	64741-60-2	Distillates (petroleum), intermediate catalytic cracked
265-084-5	64741-82-8	Distillates (petroleum), light thermal cracked
295-411-7	92045-29-9	Gas oils (petroleum), thermal-cracked, hydrodesulfurized

VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS		
EC #	CAS #	EC name
265-049-4	64741-49-7	Condensates (petroleum), vacuum tower
265-059-9	64741-58-8	Gas oils (petroleum), light vacuum
265-078-2	64741-77-1	Distillates (petroleum), light hydrocracked
269-822-7	68334-30-5	Fuels, diesel
270-671-4	68476-30-2	Fuel oil, no. 2
270-673-5	68476-31-3	Fuel oil, no. 4
270-676-1	68476-34-6	Fuels, diesel, no. 2

OTHER GAS OILS		
EC #	CAS #	EC name
265-148-2	64742-46-7	Distillates (petroleum), hydrotreated middle
265-182-8	64742-79-6	Gas oils (petroleum), hydrodesulfurized
265-183-3	64742-80-9	Distillates (petroleum), hydrodesulfurized middle

HEAVY FUEL OIL COMPONENTS		
EC #	CAS #	EC name
265-045-2	64741-45-3	Residues (petroleum), atm. Tower
265-058-3	64741-57-7	Gas oils (petroleum), heavy vacuum
265-063-0	64741-61-3	Distillates (petroleum), heavy catalytic cracked
265-064-6	64741-62-4	Clarified oils (petroleum), catalytic cracked
265-069-3	64741-67-9	Residues (petroleum), catalytic reformer fractionator
265-076-1	64741-75-9	Residues (petroleum), hydrocracked
265-081-9	64741-80-6	Residues (petroleum), thermal cracked
265-082-4	64741-81-7	Distillates (petroleum), heavy thermal cracked
265-162-9	64742-59-2	Gas oils (petroleum), hydrotreated vacuum
265-181-2	64742-78-5	Residues (petroleum), hydrodesulfurized atmospheric tower
265-189-6	64742-86-5	Gas oils (petroleum), hydrodesulfurized heavy vacuum
269-777-3	68333-22-2	Residues (petroleum), atmospheric
270-675-6	68476-33-5	Fuel oil, residual
270-796-4	68478-17-1	Residues (petroleum), heavy coker gas oil and vacuum gas oil
270-984-6	68512-62-9	Residues (petroleum), light vacuum
271-384-7	68553-00-4	Fuel oil, no. 6
271-763-7	68607-30-7	Residues (petroleum), topping plant, low-sulfur
272-184-2	68783-08-4	Gas oils (petroleum), heavy atmospheric
273-263-4	68955-27-1	Distillates (petroleum), Petroleum residues vacuum
274-684-6	70592-77-7	Distillates (petroleum), light vacuum
274-685-1	70592-78-8	Distillates (petroleum), vacuum
292-658-2	90669-76-4	Residues (petroleum), vacuum, light
295-396-7	92045-14-2	Fuel oil, heavy, high-sulfur

HEAVY FUEL OIL COMPONENTS		
EC #	CAS #	EC name
295-511-0	92061-97-7	Residues (petroleum), catalytic cracking
298-754-0	93821-66-0	Residual oils (petroleum)

UNREFINED / ACID TREATED OILS		
EC #	CAS #	EC name
265-051-5	64741-50-0	Distillates (petroleum), light paraffinic
265-052-0	64741-51-1	Distillates (petroleum), heavy paraffinic

HIGHLY REFINED BASE OILS		
EC #	CAS #	EC name
232-455-8	8042-47-5	White mineral oil (petroleum)

OTHER LUBRICANT BASE OILS		
EC #	CAS #	EC name
265-077-7	64741-76-0	Distillates (petroleum), heavy hydrocracked
265-090-8	64741-88-4	Distillates (petroleum), solvent-refined heavy paraffinic
265-091-3	64741-89-5	Distillates (petroleum), solvent-refined light paraffinic
265-096-0	64741-95-3	Residual oils (petroleum), solvent deasphalted
265-097-6	64741-96-4	Distillates (petroleum), solvent-refined heavy naphthenic
265-101-6	64742-01-4	Residual oils (petroleum), solvent-refined
265-155-0	64742-52-5	Distillates (petroleum), hydrotreated heavy naphthenic
265-156-6	64742-53-6	Distillates (petroleum), hydrotreated light naphthenic
265-157-1	64742-54-7	Distillates (petroleum), hydrotreated heavy paraffinic
265-158-7	64742-55-8	Distillates (petroleum), hydrotreated light paraffinic
265-159-2	64742-56-9	Distillates (petroleum), solvent-dewaxed light paraffinic
265-160-8	64742-57-0	Residual oils (petroleum), hydrotreated
265-166-0	64742-62-7	Residual oils (petroleum), solvent-dewaxed
265-169-7	64742-65-0	Distillates (petroleum), solvent-dewaxed heavy paraffinic
265-174-4	64742-70-7	Paraffin oils (petroleum), catalytic dewaxed heavy
265-176-5	64742-71-8	Paraffin oils (petroleum), catalytic dewaxed light
276-736-3	72623-85-9	Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based, high-viscosity
276-737-9	72623-86-0	Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based
276-738-4	72623-87-1	Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based
278-012-2	74869-22-0	Lubricating oils

UNTREATED DISTILLATE AROMATIC EXTRACTS		
EC #	CAS #	EC name
265-103-7	64742-04-7	Extracts (petroleum), heavy paraffinic distillate solvent
265-104-2	64742-05-8	Extracts (petroleum), light paraffinic distillate solvent

TREATED DISTILLATE AROMATIC EXTRACTS		
EC #	CAS #	EC name
272-180-0	68783-04-0	Extracts (petroleum), solvent-refined heavy paraffinic distillate solvent

RESIDUAL AROMATIC EXTRACTS		
EC #	CAS #	EC name
265-110-5	64742-10-5	Extracts (petroleum), residual oil solvent

SLACK WAXES		
EC #	CAS #	EC name
265-165-5	64742-61-6	Slack wax (petroleum)
292-660-3	90669-78-6	Slack wax (petroleum), clay-treated
295-523-6	92062-09-4	Slack wax (petroleum), hydrotreated

PARAFFIN AND HYDROCARBON WAXES		
EC #	CAS #	EC name
232-315-6	8002-74-2	Paraffin waxes and Hydrocarbon waxes
264-038-1	63231-60-7	Paraffin waxes and Hydrocarbon waxes, microcryst.
265-144-0	64742-42-3	Hydrocarbon waxes (petroleum), clay-treated microcryst.
265-145-6	64742-43-4	Paraffin waxes (petroleum), clay-treated
265-154-5	64742-51-4	Paraffin waxes (petroleum), hydrotreated
265-163-4	64742-60-5	Hydrocarbon waxes (petroleum), hydrotreated microcryst.

FOOTS OILS		
EC #	CAS #	EC name
265-171-8	64742-67-2	Foots oil (petroleum)
295-394-6	92045-12-0	Foots oil (petroleum), hydrotreated

PETROLATUMS		
EC #	CAS #	EC name
232-373-2	8009-03-8	Petrolatum

BITUMENS		
EC #	CAS #	EC name
232-490-9	8052-42-4	Asphalt
265-057-8	64741-56-6	Residues (petroleum), vacuum
295-518-9	92062-05-0	Residues (petroleum), thermal cracked vacuum

OXIDIZED ASPHALT		
EC #	CAS #	EC name
265-196-4	64742-93-4	Asphalt, oxidized

SULFUR		
EC #	CAS #	EC name
231-722-6	7704-34-9	Sulfur

RENEWABLE DEOXYGENATE DIESEL		
EC #	CAS #	EC name
951-915-5		Renewable hydrocarbons (deoxygenate diesel type fraction)

APPENDIX 2: REGULATORY AND OIL INDUSTRY NOTES

The classification and labelling recommendations in this report for the various categories of UVCB hydrocarbon substances have been developed by Concawe based on available information and application of a default most severe classification. It is recognised however that for some endpoints, alternative classifications may be applicable, due to the variable properties of individual substances. The ‘default’ classifications apply, unless the conditions identified in the classification Notes listed below are met. These Notes are either derived from Annex VI Part 3 of the CLP Regulation, or have been developed by the oil industry as a practical solution for the provision of reliable and consistent hazard classifications.

Note= as in the Regulation (EC) No 1272/2008, as amended by the 16th ATP.

OIN= Oil Industry Note

Note	Text
Note L	The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 3% of dimethyl sulphoxide extract as measured by IP 346 (“Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method” Institute of Petroleum, London), in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.
Note N	The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.
Note P	The harmonised classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (Einecs No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.
OIN 5	The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (Einecs No 203-625-9).
OIN 6	The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (Einecs No 203-777-6).
OIN 8	The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.
OIN 10	The classification as a carcinogen needs not apply if it can be shown that the substance has mutagenicity index (MI) less than 0.4 as measured by the test method described in ASTM E 1687-04 or if another predictive test demonstrates the substance is not a carcinogen.
OIN 14	The classification as a specific target organ toxicant category 2; H373 (May cause damage to organs through prolonged or repeated exposure) needs not apply if the substance is not classified as carcinogenic.
OIN P	The following Oil industry note (OIN) applies instead of Note P: The harmonised classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (Einecs No 200-753-

Note	Text
	7), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.
OIN 15	The following Oil industry note (OIN) applies only when Note P applies, (<0.1% benzene): The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (Einecs No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.
OIN 16	The following Oil industry note (OIN) applies to Kerosines and MK-1: The classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (Einecs No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

APPENDIX 3: DOWNSTREAM LEGISLATION IMPACTED BY THE CLP REGULATION

Citations of original legislation listed below implicitly refer to amendments to-date by subsequent acts, as applicable. Acts repealed by the listed legislation can be seen in the respective record on the European Union law portal, EUR-Lex, at <http://eur-lex.europa.eu>.

- *Registration, evaluation, authorisation and restriction of chemicals (REACH)*: Regulation (EC) No. 1907/2006 of 18 December 2006; and as further amended (see also references in Chapter 5 in this report)
- *Major accidents hazards involving dangerous substances (SEVESO III)*: Council Directive 2012/18/EU of 4 July 2012; (see also references in Chapter 5 in this report)
- *Plant protection products*: Regulation (EC) No 1107/2009 of 21 October 2009; and as further amended
- *Biocidal products*: Regulation (EU) 528/2012 of 22 May 2012;
- *Chemical agents at work*: Council Directive 98/24/EC of 7 April 1998; and as further amended
- *Carcinogens and mutagens at work*: Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004;
- *Young people at work*: Council Directive 94/33/EC of 22 June 1994;
- *Pregnant and breastfeeding workers*: Council Directive 92/85/EEC of 19 October 1992;
- *Health and safety signs at work*: Council Directive 92/58/EEC of 24 June 1992;
- *EU Ecolabel*: Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009.
- *Aerosol dispensers*: Council Directive 75/324/EEC of 20 May 1975;
- *Ambient air quality and cleaner air for Europe*: Directive 2008/50/EC of the European Parliament and Council of 21 May 2008;
- *Import and export of hazardous substances*: Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012;
- *Hazardous waste*: Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 (Waste Framework Directive);
- *Batteries and accumulators and their waste*: Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006;
- *Transport of Dangerous Goods*: Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008;
- *Detergents*: Regulation (EC) No 648/2004 of 31 March 2004;
- *Medical devices*: Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017

- *Cosmetic products*: Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009;
- *Safety of toys*: Directive 2009/48/EC of the European Parliament and of the Council of 18 June 2009
- *Limitation of emissions of volatile organic compounds from use of organic solvents*:
 - Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) - use of organic solvents in certain activities and installations;
 - Directive 2004/42/EC of the European Parliament and of the Council of - use of organic solvents in certain paints and varnishes and vehicle refinishing products;
- *End-of-life vehicles*: Directive 2000/53/EC of the European Parliament and of the Council.
- *Waste electrical and electronic equipment (WEEE)*: Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012.

APPENDIX 4: APPLICATIONS FOR USING TEST DATA FOR THE UVCB SUBSTANCE

1. Application of Repeat Dose Toxicity Classifications (Benzene) to Low Boiling Naphthas (Gasolines)

In CLP Annex VI benzene is classified for repeat dose toxicity as H372 based on effects on the hematopoietic system. According to the rules laid down in CLP, classification and labelling of low boiling naphthas (and gasoline) for repeat dose toxicity would be triggered at benzene concentrations equal to or greater than 1% w/w.

Concawe believes it is inappropriate to apply classification for repeat dose toxicity to low boiling naphthas (gasolines) with concentrations of benzene below 10% for the following reasons:

- Repeated dermal dose studies with naphthas with exposures up to 2000 mg/kg showed no evidence of hematologic effects.
- Inhalation studies with gasoline and naphthas also showed no evidence of hematologic effects.
- Naphtha blending streams tested in sub chronic inhalation studies with exposures up to 7500 ppm showed some haematological changes, mainly reduced haemoglobin and haematocrit levels and some reductions in leukocyte and lymphocyte numbers in male rats from the highest exposure groups. Since these effects were exclusively found in the male rat, and spleen weights were unaltered, the effects are believed to be secondary to the renal changes (alpha-2μ-globulin induced nephropathy).

2. Application of Repeat Dose Toxicity Classifications (Toluene) to Low Boiling Naphthas (Gasolines)

In CLP Annex VI, toluene is classified for repeat dose toxicity as H373 based on ototoxicity observed in animal studies at prolonged exposure to toluene vapours. According to the rules laid down in CLP, classification of low boiling naphthas (gasolines) for repeat dose toxicity would be triggered at toluene concentrations equal to or greater than 10% w/w. Concawe believes it is inappropriate to classify low boiling naphthas (gasolines) for repeat dose toxicity for the following reasons:

- Long-term inhalation studies with gasoline (PS-6) at concentrations up to 2056 ppm did not reveal any signs of neurotoxicity.
- Prolonged gasoline abuse (gasoline sniffing) has led to various (reversible) neurological effects but not ototoxicity.
- Toluene-induced ototoxicity cannot realistically be achieved since ototoxicity was only observed at prolonged exposure to concentrations of toluene that would cause explosive mixtures with gasoline.
- Exposure to gasoline vapours, and hence the toluene therein, is sufficiently limited by classification of gasoline as Cat. 1B carcinogen to prevent any ototoxicity from gasoline; existing occupational exposure limits for hydrocarbons would further restrict potential exposure.

3. Application of Repeat Dose Toxicity Classifications (n-hexane) to Low Boiling Naphthas (Gasolines)

Normal-hexane (n-hexane - CAS 110-54-3) is a linear hydrocarbon of 6 carbon atoms.

Exposure to n-hexane has been associated with a peripheral neuropathy in humans. This is reflected in EU-CLP harmonised classification for n-hexane as STOT RE 2; H373. This classification has a specific concentration limit of > 5% w/w, for mixtures containing n-hexane.

The toxicity on the peripheral nervous system has been shown to result from the action of a specific n-hexane metabolite: 2,5-hexane dione. This distinguishes n-hexane from other C6 hydrocarbons (hexane isomers) and hydrocarbon substances' stream constituents, because only n-hexane is metabolised to the toxic metabolite and has a threshold depending on whether exposure is to pure n-hexane or commercial hexane (hexane isomers with up to 53% n-hexane).

This was demonstrated in a series of studies comparing n-hexane to commercial hexane.

Rats exposed to n-hexane at 500 ppm (~ 1760 mg/m³) developed neuropathy after 6 months of treatment. Co-exposure to hexane isomers did not potentiate n-hexane associated neurotoxicity.

In a neurotoxicity test where functional battery performance and motor activity was assessed, rats were exposed to concentrations of up to 9000 ppm (~ 31680 mg/m³) to commercial hexane. Results showed no effects to behaviour or evidence of toxicity setting the NOAEC for sub-chronic neurological effects at 9000 ppm.

Lifetime exposure of rats and mice to 9000 ppm of commercial hexane did not indicate significant differences in survivorship between treated and control animals.

Therefore, test data of commercial hexane indicates that peripheral neuropathy is a threshold effect which doesn't manifest itself in complex substances with n-hexane concentrations below 53%. Thus petroleum streams (e.g. Naphtha) which contain n-hexane at considerably lower concentrations than 53% can be considered to be below the threshold of concern and thus not classifiable as STOT RE 2; H373.

APPENDIX 5: HAZARD CLASSIFICATION FOR DEVELOPMENTAL TOXICITY ACCORDING TO CLP

According to CLP, Reproductive Toxicity is differentiated into three sub-headings:

- A) Adverse effects on sexual function and fertility;
- B) Adverse effects on development of the offspring;
- C) Adverse effects on or via lactation.

Developmental toxicity refers primarily to part B. A typical guideline study design that enables evaluation of this parameter is OECD TG 414. Alternatively, relevant data can be derived from the screening studies TG 421/ 422 or through other non-guideline studies, although these are not typically considered sufficiently robust to drive classification.

For parts A and/or C the multi-generation study TG 416, TG 426 or TG 443 is applicable; however, these aspects are not further discussed here.

When reviewing developmental toxicity study data for the purposes of classification and labelling, key concerns are: (a) death of the developing organism, (b) structural abnormality, (c) altered growth, and (d) functional deficiency. It is also clear that a distinction is made between significant (i.e., irreversible) effects and those indicative of developmental delays. If any developmental effect is observed in the presence of maternal toxicity, there is a need to carefully evaluate both the severity of the developmental effect and the nature of the maternal effect(s) as both may ultimately influence the decision to classify.

The classification guidelines emphasize that the evaluation should start with an assessment of the developmental effects before the potential for maternal influence is considered. Accordingly, when developmental effects are reported, it is best to review the original study reports, considering both groups' mean and individual litter data. Although some valuable insight can be gained from individual pup data, it is important to recognise that the recognised statistical unit in reproductive toxicity studies is the litter and not the individual foetus/pup. Among the parameters that should be considered are pre- and post-implantation loss, total number of progeny and percentage live.

As stated in the CLP legislation (3.7.2.4.3) classification for reproductive toxicity is not necessarily the outcome in the case of minor developmental changes, when there is only a small reduction in foetal/pup body weight or retardation of ossification when seen in association with maternal toxicity. However classification shall be considered where there is a significant toxic effect in the offspring, e.g. irreversible effects such as structural malformations, embryo/foetal lethality and /or significant post-natal functional deficiencies. In these cases, in depth review of the study report is warranted and if appropriate a comprehensive overview on a litter by litter basis to assess the impact of maternal toxicity on foetal development. Additionally the statistical significance of any deficiencies should be considered in the evaluation of biological significance. Small changes of statistical significance but of no biological significance are not considered sufficient to classify as a developmental toxicant.

In general, when there is evidence of severe developmental toxicity such as foetal death, resorptions and/or major malformations, and there is no basis to judge these effects as not relevant to humans, then maternal toxicity needs to be considered. Normally, such effects would lead to classification unless the maternal toxicity is severe, e.g. lethality, significant weight loss or reduced weight gain, or inanition. In such cases, a justification should be prepared taking into consideration the nature of both the foetal and maternal effects. When evaluating whether maternal toxicity may be present, factors such as irritation (mild or severe), body weight gain

throughout gestation, and food consumption should be examined. Classification may not be justified if the developmental effect is judged to be of low or minimal toxicological significance, for example reductions in pup weight gain, delayed ossification, rib variations, and/or other evidence of developmental delays.

Once this initial assessment has been completed, then other factors can be considered. Ultimately, classification as a reproductive toxicant is based on 'expert judgement' taking into account the total weight of evidence. This means that all available information that bears on the determination of reproductive toxicity is considered together, such as epidemiological studies, case reports in humans and specific reproduction studies along with sub-chronic, chronic and special study results in animals that provide relevant information regarding toxicity to growth, development and reproduction. The weight given to the available evidence will be influenced by factors such as the quality of the studies, consistency of results, nature and severity of effects, the presence of maternal toxicity in experimental animal studies, level of statistical significance for inter-group differences, number of endpoints affected, relevance of route of administration to humans and freedom from bias.

APPENDIX 6: C&L PERMUTATIONS

The information included in this Appendix is aimed at supporting the industry with recommended classification and labelling (C&L), as needed for either direct inclusion in the safety data sheet (SDS) for UVCB hydrocarbon substances or as basis for devising the classification and labelling of mixtures containing UVCB hydrocarbon substances, while considering the relevant substance characteristics (C&L drivers) leading to a certain classification and labelling (C&L permutation).

For each classified C&L permutation the following information is provided:

- **Classification and labelling according to CLP / GHS.** Contains the classification of the substance for each classified endpoint (for Section 2.1 of the SDS):
 - hazard class;
 - hazard category;
 - associated hazard statement (H), with code and full text including variable parts completed.
- **Labelling.** Contains the following elements (for the Label and for Section 2.2 of the SDS):
 - signal word;
 - hazard pictogram(s) (GHS), with code, description and picture;
 - hazard statement(s) (H), with code and full text including variable parts completed;
 - not more than six recommended precautionary statement(s) (P), with code and full text - the text in *italics* between brackets provides instructions where the applicable precautionary statement text must be adapted by each manufacturer/supplier;
 - when relevant, additional applicable label elements (EUH066, ‘lamp oils and grill lighters’, ‘restricted to professional users’).
- **Full list of Precautionary statements.** For inclusion into appropriate sections of the SDS main body, as deemed useful for industrial and professional users:
 - all precautionary statement(s) (P) relevant for the hazard classification, with code and full text - the text in *italics* between brackets provides instructions where the applicable precautionary statement text must be adapted by each manufacturer/supplier.

The C&L permutations result from the entry in Part 3 of Annex VI of CLP, if any, and from the self-classification for all other hazard classes or differentiations not covered there, as relevant. Where relevant, the Note(s) from Part 3 of Annex VI of CLP and/or the Oil Industry Note(s) (OIN) that have been applied to the C&L permutation are provided.

Each chapter in this Appendix is named with the full group name and (in brackets) the short name of the group.

Each chapter contains all permutations that could be applied to the relevant UVCB hydrocarbon substances category. For substances which have been registered under REACH not all permutations listed within a UVCB hydrocarbon substance category are applicable to every substance. The tables in each chapter show which C&L permutations codes can currently be assigned to each substance within the UVCB hydrocarbon substance Categories.

The classification given in the SDS should be the same as the classification provided in the notification to the C&L inventory and/or the substance registration dossier submitted to ECHA.

CRUDE OILS (CRUDEOIL)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. Crudeoil) must be applied.

C&L drivers			C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $< 23^\circ\text{C}$	Initial boiling point $\leq 35^\circ\text{C}$	CLP 1. Crudeoil
		Initial boiling point $> 35^\circ\text{C}$	CLP 2. Crudeoil
	Flash point $\geq 23^\circ\text{C}$ and $\leq 60^\circ\text{C}$		CLP 3. Crudeoil
	Flash point $> 60^\circ\text{C}$		CLP 4. Crudeoil
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $< 23^\circ\text{C}$	Initial boiling point $\leq 35^\circ\text{C}$	CLP 5. Crudeoil
		Initial boiling point $> 35^\circ\text{C}$	CLP 6. Crudeoil
	Flash point $\geq 23^\circ\text{C}$ and $\leq 60^\circ\text{C}$		CLP 7. Crudeoil
	Flash point $> 60^\circ\text{C}$		CLP 8. Crudeoil

Due to the variability of crude oil composition, the environmental toxicity may differ from that given below; therefore, crude oils can be classified using specific experimental data on the actual type of crude oil under consideration.

CRUDE OILS		
EC #	CAS #	Acceptable C&L permutations
232-298-5	8002-05-9	CLP 1, CLP 2, CLP 3, CLP 4, CLP 5, CLP 6, CLP 7, CLP 8

CLP 1. Crudeoil (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $< 23^\circ\text{C}$ and Initial boiling point $\leq 35^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P337 + P313: If eye irritation persists: Get medical advice/attention.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. Crudeoil (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $< 23^\circ\text{C}$ and Initial boiling point $> 35^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P337 + P313: If eye irritation persists: Get medical advice/attention.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. Crudeoil (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $\geq 23^\circ\text{C}$ and $\leq 60^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P370 + P378: In case of fire: Use ... to extinguish. (...Manufacturer/supplier to specify appropriate media. – if water increases risk.)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 4. Crudeoil (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $> 60^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P337 + P313: If eye irritation persists: Get medical advice/attention.
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 5. Crudeoil (Viscosity > 20.5 mm²/s at 40 °C; Flash point < 23 °C and Initial boiling point ≤ 35 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 6. Crudeoil (Viscosity > 20.5 mm²/s at 40 °C; Flash point < 23 °C and Initial boiling point > 35 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. — if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 7. Crudeoil (Viscosity > 20.5 mm²/s at 40 °C; Flash point ≥ 23 °C and ≤ 60 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 8. Crudeoil (Viscosity > 20.5 mm²/s at 40 °C; Flash point > 60 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Serious damage / eye irritation:	Eye Irrit. 2	H319: Causes serious eye irritation.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, liver, spleen, thymus	H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H373: May cause damage to blood, liver, spleen and thymus through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.
Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

LOW BOILING POINT NAPHTHAS (GASOLINES) (NAPHTHA)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 01. Naphtha) must be applied.

C&L drivers					C&L permutation
Benzene \geq 0.1%w/w	Toluene \geq 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 01. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 02. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 03. Naphtha
	Toluene \geq 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 04. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 05. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 06. Naphtha
	Toluene $<$ 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 07. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 08. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 09. Naphtha
	Toluene $<$ 3% w/w	n-hexane $<$ 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 10. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 11. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 12. Naphtha
Benzene $<$ 0.1%w/w Cumene $<$ 0.1%w/w	Toluene \geq 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 13. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 14. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 15. Naphtha
	Toluene \geq 3% w/w	n-hexane $<$ 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 16. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 17. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 18. Naphtha
	Toluene $<$ 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 19. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 20. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 21. Naphtha
	Toluene $<$ 3% w/w	n-hexane $<$ 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 22. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 23. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 24. Naphtha
Benzene $<$ 0.1%w/w Cumene \geq 0.1%w/w	Toluene \geq 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 25. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 26. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 27. Naphtha
	Toluene \geq 3% w/w	n-hexane $<$ 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 28. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 29. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 30. Naphtha
	Toluene $<$ 3% w/w	n-hexane \geq 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 31. Naphtha
				Initial boiling point $> 35^{\circ}\text{C}$	CLP 32. Naphtha
			Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$		CLP 33. Naphtha
	Toluene $<$ 3% w/w	n-hexane $<$ 3% w/w	Flash point $< 23^{\circ}\text{C}$	Initial boiling point $\leq 35^{\circ}\text{C}$	CLP 34. Naphtha

			Initial boiling point > 35 °C	CLP 35. Naphtha
			Flash point ≥ 23 °C and ≤ 60 °C	CLP 36. Naphtha

Note: The substances with EC# No 295-418-5, 613-683-0 and 614-725-0 are not included in Annex VI of CLP and therefore Note OIN P is applied instead of Note P to permutations CLP 13 to CLP 36.

In accordance with the 5th ATP to the CLP Regulation, the following additional classification applies to the substance with EC No 265-185-4.

Hazard class	Hazard category	Hazard statement
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Central nervous system	H372: Causes damage to central nervous system through prolonged or repeated exposure.

Note 1: In the registration dossiers, the permutations CLP 01 to CLP 24 for EC No 265-185-4 are named as **White Spirit** instead of Naphtha, to highlight the different hazard profile.

Note 2: Additional classification and labelling STOT RE 1 applies case-by-case if Benzene content is ≥10% w/w in Naphtha category substances.

In this particular case, the following precautionary statements will add (if not already included) to the full list as mentioned for each permutation:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P314: Get medical advice/attention if you feel unwell.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

LOW BOILING POINT NAPHTHAS (GASOLINES)		
EC #	CAS #	Acceptable C&L permutations
232-349-1	8006-61-9	CLP 01
265-041-0	64741-41-9	CLP 01, CLP 02, CLP 05, CLP 06, CLP 08, CLP 11, CLP 12, CLP 18, CLP 23, CLP 24, CLP 30, CLP 35, CLP 36
265-042-6	64741-42-0	CLP 01, CLP 02, CLP 03, CLP 04, CLP 05, CLP 06, CLP 07, CLP 08, CLP 09, CLP 10, CLP 13, CLP 19, CLP 20, CLP 22, CLP 23, CLP 25, CLP 31, CLP 32, CLP 34, CLP 35
265-046-8	64741-46-4	CLP 01, CLP 02, CLP 04, CLP 07, CLP 08, CLP 09, CLP 10
265-055-7	64741-54-4	CLP 01, CLP 02, CLP 03, CLP 04, CLP 05, CLP 10, CLP 11, CLP 16, CLP 17, CLP 18, CLP 22, CLP 23, CLP 24, CLP 28, CLP 29, CLP 30, CLP 34, CLP 35, CLP 36
265-056-2	64741-55-5	CLP 01, CLP 02, CLP 04, CLP 05, CLP 07, CLP 10, CLP 11
265-065-1	64741-63-5	CLP 01, CLP 02, CLP 04, CLP 05, CLP 07, CLP 08, CLP 09, CLP 10
265-066-7	64741-64-6	CLP 01, CLP 19, CLP 22, CLP 23, CLP 31, CLP 34, CLP 35
265-068-8	64741-66-8	CLP 20, CLP 23, CLP 32, CLP 35
265-070-9	64741-68-0	CLP 01, CLP 02, CLP 05, CLP 17, CLP 24, CLP 29, CLP 36
265-071-4	64741-69-1	CLP 01, CLP 02, CLP 03, CLP 05, CLP 07, CLP 08, CLP 09, CLP 10, CLP 11, CLP 19, CLP 20, CLP 22, CLP 23, CLP 31, CLP 32, CLP 34, CLP 35
265-073-5	64741-70-4	CLP 01, CLP 02, CLP 07, CLP 10, CLP 13, CLP 19, CLP 20, CLP 21, CLP 22, CLP 23, CLP 25, CLP 31, CLP 32, CLP 33, CLP 34, CLP 35
265-075-6	64741-74-8	CLP 01, CLP 07, CLP 08, CLP 11
265-079-8	64741-78-2	CLP 02, CLP 05, CLP 07, CLP 08, CLP 11, CLP 14, CLP 17, CLP 20, CLP 21, CLP 23, CLP 24, CLP 26, CLP 29, CLP 32, CLP 33, CLP 35, CLP 36

LOW BOILING POINT NAPHTHAS (GASOLINES)		
EC #	CAS #	Acceptable C&L permutations
265-085-0	64741-83-9	CLP 01, CLP 02, CLP 04, CLP 07, CLP 08, CLP 10, CLP 24, CLP 36
265-086-6	64741-84-0	CLP 01, CLP 02, CLP 08, CLP 13, CLP 20, CLP 22, CLP 23, CLP 25, CLP 32, CLP 34, CLP 35
265-089-2	64741-87-3	CLP 01, CLP 02, CLP 04, CLP 05, CLP 08, CLP 10, CLP 20, CLP 24, CLP 32, CLP 36
265-150-3	64742-48-9	CLP 01, CLP 02, CLP 05, CLP 11, CLP 14, CLP 17, CLP 18, CLP 23, CLP 24, CLP 26, CLP 29, CLP 30, CLP 35, CLP 36
265-151-9	64742-49-0	CLP 01, CLP 02, CLP 03, CLP 04, CLP 07, CLP 08, CLP 09, CLP 10, CLP 13, CLP 16, CLP 20, CLP 22, CLP 23, CLP 24, CLP 25, CLP 28, CLP 32, CLP 34, CLP 35, CLP 36
265-178-6	64742-73-0	CLP 01, CLP 02, CLP 04, CLP 05, CLP 07, CLP 08, CLP 10, CLP 11, CLP 17, CLP 29
265-185-4	64742-82-1	CLP 01, CLP 02, CLP 03, CLP 05, CLP 07, CLP 11, CLP 20, CLP 23, CLP 24, CLP 32, CLP 35, CLP 36
265-192-2	64742-89-8	CLP 01, CLP 07, CLP 08, CLP 22, CLP 23, CLP 24, CLP 34, CLP 35, CLP 36
265-199-0	64742-95-6	CLP 04, CLP 05, CLP 08, CLP 24, CLP 36
270-660-4	68475-79-6	CLP 01, CLP 02, CLP 03, CLP 10, CLP 22, CLP 34
270-686-6	68476-46-0	CLP 02, CLP 05, CLP 10, CLP 11.
270-690-8	68476-50-6	CLP 01, CLP 02, CLP 04, CLP 07, CLP 08, CLP 19, CLP 22, CLP 31, CLP 34
270-695-5	68476-55-1	CLP 01, CLP 10, CLP 11, CLP 22, CLP 34
270-993-5	68513-03-1	CLP 01, CLP 02, CLP 08
271-267-0	68527-27-5	CLP 01, CLP 04, CLP 10, CLP 11, CLP 22, CLP 23, CLP 34, CLP 35
271-635-0	68603-08-7	CLP 05
271-727-0	68606-11-1	CLP 01, CLP 02, CLP 07, CLP 08, CLP 22, CLP 23, CLP 24, CLP 34, CLP 35, CLP 36
272-186-3	68783-12-0	CLP 01, CLP 02, CLP 07, CLP 08, CLP 16, CLP 17, CLP 21, CLP 22, CLP 23, CLP 24, CLP 28, CLP 29, CLP 33, CLP 34, CLP 35, CLP 36
272-895-8	68919-37-9	CLP 01, CLP 02, CLP 05, CLP 10, CLP 11, CLP 22, CLP 23, CLP 24, CLP 34, CLP 35, CLP 36
272-931-2	68921-08-4	CLP 01, CLP 07, CLP 08
273-271-8	68955-35-1	CLP 01, CLP 02, CLP 04, CLP 05, CLP 07, CLP 08, CLP 24, CLP 36
285-510-3	85116-59-2	CLP 01, CLP 02, CLP 10, CLP 20, CLP 32
289-220-8	86290-81-5	CLP 01, CLP 02, CLP 03, CLP 04, CLP 05, CLP 06, CLP 07, CLP 08, CLP 09, CLP 10, CLP 11, CLP 12, CLP 13, CLP 14, CLP 16, CLP 17, CLP 19, CLP 20, CLP 22, CLP 23, CLP 25, CLP 26, CLP 28, CLP 29, CLP 31, CLP 32, CLP 34, CLP 35
295-298-4	91995-38-9	CLP 07, CLP 10, CLP 22, CLP 34
295-331-2	91995-68-5	CLP 01, CLP 05
295-418-5	92045-37-9	CLP 08, CLP 23, CLP 24, CLP 35, CLP 36
295-433-7	92045-52-8	CLP 01, CLP 04, CLP 05, CLP 07, CLP 08
295-440-5	92045-58-4	CLP 08, CLP 23, CLP 35
295-441-0	92045-59-5	CLP 01, CLP 02, CLP 04, CLP 05, CLP 10, CLP 11, CLP 12, CLP 23, CLP 35
295-442-6	92045-60-8	CLP 19, CLP 20, CLP 21, CLP 22, CLP 23, CLP 24, CLP 31, CLP 32, CLP 34, CLP 35
295-445-2	92045-63-1	CLP 08
295-446-8	92045-64-2	CLP 08
296-903-4	93165-19-6	CLP 01, CLP 02, CLP 05, CLP 08, CLP 19, CLP 20, CLP 22, CLP 23, CLP 29, CLP 35, CLP 36
297-401-8	93571-75-6	CLP 02, CLP 05, CLP 06, CLP 17, CLP 23, CLP 24, , CLP 29, CLP 35, CLP 36
613-683-0	64741-72-6	CLP 04, CLP 22, CLP 23, CLP 34, CLP 35
614-725-0	68783-11-9	CLP 13, CLP 22, CLP 23, CLP 24, CLP 34, CLP 35, CLP 36

LOW BOILING POINT NAPHTHAS (GASOLINES)		
EC #	CAS #	Acceptable C&L permutations
940-595-2		CLP 01, CLP 02, CLP 07, CLP 10, CLP 13, CLP 19, CLP 20, CLP 21, CLP 22, CLP 23, CLP 25, CLP 31, CLP 32, CLP 33, CLP 34, CLP 35

CLP 01. Naphtha (Benzene \geq 0.1% w/w; Toluene \geq 3% w/w; n-hexane \geq 3% w/w; Flashpoint $< 23^{\circ}\text{C}$ and Initial boiling point $\leq 35^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H340: May cause genetic defects.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT
induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 02. Naphtha (Benzene $\geq 0.1\%$ w/w; Toluene $\geq 3\%$ w/w; n-hexane $\geq 3\%$ w/w; Flashpoint $< 23^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT
induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 03. Naphtha (Benzene \geq 0.1% w/w; Toluene \geq 3% w/w; n-hexane \geq 3% w/w; Flashpoint \geq 23 °C and \leq 60 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H340: May cause genetic defects.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT
induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 04, Naphtha (Benzene \geq 0.1% w/w; Toluene \geq 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point \leq 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 05. Naphtha (Benzene \geq 0.1% w/w; Toluene \geq 3% w/w; n-hexane $<$ 3% w/w; Flashpoint $<$ 23 °C and Initial boiling point $>$ 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H340: May cause genetic defects.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*. Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. *(Manufacturer/supplier to specify applicable conditions.)*
P264: Wash ... thoroughly after handling. *(Manufacturer/supplier to specify parts of the body to be washed after handling.)*
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. — if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 06. Naphtha (Benzene \geq 0.1% w/w; Toluene \geq 3% w/w; n-hexane $<$ 3% w/w; Flashpoint \geq 23 °C and \leq 60 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media.*
– *if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 07. Naphtha (Benzene \geq 0.1% w/w; Toluene < 3% w/w; n-hexane \geq 3% w/w; Flashpoint < 23 °C and Initial boiling point \leq 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion/irritation	Skin Irrit. 2	H315: Causes skin irritation
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 08. Naphtha (Benzene \geq 0.1% w/w; Toluene < 3% w/w; n-hexane \geq 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.

Hazard class	Hazard category	Hazard statement
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P321: Specific treatment (see ... on this label). (...Reference to supplemental first aid instruction.)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...Manufacturer/supplier to specify appropriate media. – if water increases risk.)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (...in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 09. Naphtha (Benzene \geq 0.1% w/w; Toluene $<$ 3% w/w; n-hexane \geq 3% w/w; Flashpoint \geq 23 °C and \leq 60 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.

Hazard class	Hazard category	Hazard statement
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 10. Naphtha (Benzene \geq 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point \leq 35 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. — if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 11. Naphtha (Benzene \geq 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 12. Naphtha (Benzene \geq 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint \geq 23 °C and \leq 60 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Germ cell mutagenicity:	Muta. 1B	H340: May cause genetic defects.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 13. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P262: Do not get in eyes, on skin, or on clothing

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 14. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

Except for EC 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children, (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media.* – *if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 15. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

Except for EC 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statementsGeneral:

P102: Keep out of reach of children. (*In case of consumer use P102 should be added on the label*)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 16. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.

Hazard class	Hazard category	Hazard statement
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361f: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P321: Specific treatment (see ... on this label). (...Reference to supplemental first aid instruction.)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...Manufacturer/supplier to specify appropriate media.
— if water increases risk.)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (...in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 17. Naphtha (Benzene < 0.1% w/w ; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not

classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label)*

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P262: Do not get in eyes, on skin, or on clothing

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 18. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statementsGeneral:

P102: Keep out of reach of children. (*In case of consumer use P102 should be added on the label*)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P321: Specific treatment (see ... on this label). (... Reference to supplemental first aid instruction.)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...Manufacturer/supplier to specify appropriate media. – if water increases risk.)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 19. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 20. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statementsGeneral:

P102: Keep out of reach of children. (*In case of consumer use P102 should be added on the label*)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 21. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 22. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 23. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statementsGeneral:

P102: Keep out of reach of children. (*In case of consumer use P102 should be added on the label*)

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 24. Naphtha (Benzene < 0.1% w/w; Cumene < 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Notes (OIN) have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

For all substances in the Naphtha category, the following Oil industry Note (OIN) has been considered:

- OIN 15 - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.

Hazard class	Hazard category	Hazard statement
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.) Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label)

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P262: Do not get in eyes, on skin, or on clothing
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 25. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...

(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 26. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national /international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 27. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane ≥ 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility and unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/ supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. — if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/ international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.

CLP 28. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Note has been applied:

- OIN 6- The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...

(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 29. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Note has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...

(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/ national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 30. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene ≥ 3% w/w; n-hexane < 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Note has been applied:

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification

in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H361d: Suspected of damaging the unborn child.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT
induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media.* — *if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.

CLP 31. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Note has been applied:

- OIN 5- The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/ supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 32. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Note has been applied:

- OIN 5- The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/ supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P321: Specific treatment (see ... on this label). (... Reference to supplemental first aid instruction.)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...Manufacturer/supplier to specify appropriate media. – if water increases risk.)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.

CLP 33. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane ≥ 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Note has been applied:

- OIN 5- The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification

in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Fertility	H361f: Suspected of damaging fertility.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H361f: Suspected of damaging fertility.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment)

P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT induce vomiting.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. — if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.

CLP 34. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point ≤ 35 °C)

The following Oil Industry Notes have been applied:

- OIN 5- The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 1	H224: Extremely flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H224: Extremely flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/ supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P264: Wash ... thoroughly after handling. *(Manufacturer/supplier to specify parts of the body to be washed after handling.)*
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/ regional/ national/ international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 35. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint < 23 °C and Initial boiling point > 35 °C)

The following Oil Industry Notes have been applied:

- OIN 5 - The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).
- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 2	H225: Highly flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... Manufacturer/supplier to specify other equipment.)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/ regional/ national/ international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 36. Naphtha (Benzene <0.1% w/w; Cumene ≥ 0.1% w/w; Toluene < 3% w/w; n-hexane < 3% w/w; Flashpoint ≥ 23 °C and ≤ 60 °C)

The following Oil Industry Notes have been applied:

- OIN 5- The classification as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) needs not apply if it can be shown that the substance contains less than 3% w/w toluene (EINECS No 203-625-9).

- OIN 6 - The classification as a reproductive toxicant category 2; H361f (Suspected of damaging fertility) needs not apply if it can be shown that the substance contains less than 3% w/w n-hexane (EINECS No 203-777-6).

Except for EC No 295-418-5, 613-683-0 and 614-725-0, the following Note has been applied:

- Note P - The classification as a carcinogen or mutagen applies unless it can be shown that the substance contains less than 0,1% w/w benzene (EINECS No 200-753-7), in which case a classification in accordance with Title II of this Regulation shall be performed also for those hazard classes. Where the substance is not classified as a carcinogen or mutagen, at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 shall apply.

For EC No 295-418-5, 613-683-0 and 614-725-0, the following Oil industry Note (OIN) has been applied instead of Note P:

- OIN P - The classifications as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1% w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-) P260-P262-P301+P310-P331 shall apply.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H350: May cause cancer.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310 + P331: IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
(*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*). : Do NOT induce vomiting.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

KEROSINES (Kerosine)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. Kerosine) must be applied.

C&L drivers	C&L permutation
Cumene <0.1% w/w; Flashpoint $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$	CLP 1. Kerosine
Cumene <0.1% w/w; Flashpoint $> 60^{\circ}\text{C}$	CLP 2. Kerosine
Cumene $\geq 0.1\%$ w/w; Flashpoint $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$	CLP 3. Kerosine
Cumene $\geq 0.1\%$ w/w; Flashpoint $> 60^{\circ}\text{C}$	CLP 4. Kerosine

KEROSINES		
EC #	CAS #	Acceptable C&L permutations
232-366-4	8008-20-6	CLP 1, CLP 2, CLP 3, CLP 4
265-149-8	64742-47-8	CLP 1, CLP 2, CLP 3, CLP 4
265-184-9	64742-81-0	CLP 1, CLP 2, CLP 3, CLP 4
265-198-5	64742-94-5	CLP 1, CLP 2, CLP 3, CLP 4
294-799-5	91770-15-9	CLP 1, CLP 2, CLP 3, CLP 4

CLP 1. Kerosine (Cumene <0.1% w/w; Flashpoint $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label)*

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*

P331: Do NOT induce vomiting.

Additional labelling requirements:

Where the substance is sold to the general public (Consumers) for use in grill lighters or lamp oils, then container labels should be visibly, legibly and indelibly marked as follows, in accordance with REACH Annex XVII:

Lamp oils

- Keep lamps filled with this liquid out of the reach of children.
- Just a sip of lamp oil - or even sucking the wick of lamps may lead to life-threatening lung damage.

Grill lighter fluids

- Just a sip of grill lighter may lead to life-threatening lung damage.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label)*

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. *(... Manufacturer/supplier to specify other equipment.)*

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. *(Manufacturer/supplier to specify applicable conditions.)*

P264: Wash ... thoroughly after handling. *(Manufacturer/supplier to specify parts of the body to be washed after handling.)*

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*

P302 + P352: IF ON SKIN: Wash with plenty of water/... *(...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)*

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

The following Oil Industry Note (OIN) has been applied:

- OIN 16: The classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

CLP 2. Kerosine (Cumene <0.1% w/w; Flashpoint > 60°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label)*
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*
P331: Do NOT induce vomiting.

Additional labelling requirements:

Where the substance is sold to the general public (Consumers) for use in grill lighters or lamp oils, then container labels should be visibly, legibly and indelibly marked as follows, in accordance with REACH Annex XVII:

Lamp oils

- Keep lamps filled with this liquid out of the reach of children.
- Just a sip of lamp oil - or even sucking the wick of lamps may lead to life-threatening lung damage.

Grill lighter fluids

- Just a sip of grill lighter may lead to life-threatening lung damage.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label)*

Prevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. *(Manufacturer/supplier to specify applicable conditions.)*
P264: Wash ... thoroughly after handling. *(Manufacturer/supplier to specify parts of the body to be washed after handling.)*
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*
P302 + P352: IF ON SKIN: Wash with plenty of water/... *(...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)*
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. *(...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)*
P321: Specific treatment (see ... on this label). *(... Reference to supplemental first aid instruction.)*
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

The following Oil Industry Note (OIN) has been applied:

- OIN 16: The classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

CLP 3. Kerosine (Cumene \geq 0.1% w/w; Flashpoint \geq 23 °C and \leq 60 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3	H226: Flammable liquid and vapour.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

General:

P201: Obtain special instructions before use.

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
(*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 4. Kerosine (Cumene \geq 0.1% w/w; Flashpoint $> 60^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

General:

P201: Obtain special instructions before use.

Prevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

MK1 DIESEL FUEL (MK1)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 2. MK1) must be applied.

C&L drivers	C&L permutation
Cumene <0.1% w/w	CLP 1. MK1
Cumene ≥ 0.1% w/w	CLP 2. MK1

MK1 DIESEL FUEL		
EC #	CAS #	Acceptable C&L permutations
931-250-7	None	CLP 1, CLP 2

CLP 1. MK1 (Cumene < 0.1% w/w)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system Route of exposure: Inhalation	H336: May cause drowsiness or dizziness.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Full list of Precautionary statements

Prevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

The following Oil Industry Note (OIN) has been applied:

- OIN 16: The classification as a carcinogen applies unless it can be shown that the substance contains less than 0.1% w/w cumene (EINECS No 202-704-5), in which case a classification in accordance with Title II of CLP Regulation shall be performed also for that hazard class.

CLP 2. MK1 (Cumene \geq 0.1% w/w)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - single exposure:	STOT Single Exp. 3 Affected organs: Central nervous system	H336: May cause drowsiness or dizziness.

Hazard class	Hazard category	Hazard statement
	Route of exposure: Inhalation	
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H350: May cause cancer.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

STRAIGHT-RUN GAS OILS (SRGO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. SRGO) must be applied.

C&L drivers		C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$	CLP 1. SRGO
	Flash point $> 75^\circ\text{C}$	CLP 2. SRGO
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$	CLP 3. SRGO
	Flash point $> 75^\circ\text{C}$	CLP 4. SRGO

STRAIGHT-RUN GAS OILS		
EC No	CAS No	Acceptable C&L permutations
265-043-1	64741-43-1	CLP 1, CLP 2, CLP 3, CLP 4
265-044-7	64741-44-2	CLP 1, CLP 2
272-341-5	68814-87-9	CLP 1, CLP 2
272-817-2	68915-96-8	CLP 1, CLP 2, CLP 4

CLP 1. SRGO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Liver, spleen, bone marrow	H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^\circ\text{C}$ and $\leq 75^\circ\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H332: Harmful if inhaled.
H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P273: Avoid release to the environment.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statementsPrevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. SRGO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $> 75^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Liver, spleen, bone marrow	H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.
H332: Harmful if inhaled.
H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*).
P273: Avoid release to the environment.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statements

Prevention:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*).

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*).

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*).

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*).

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. SRGO (Viscosity > 20.5 mm²/s at 40 °C; Flash point ≥ 23 °C and ≤ 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Liver, spleen, bone marrow	H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between ≥ 55 °C and ≤ 75 °C may be regarded as Category 3.

Labelling

Signal word: Warning

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H332: Harmful if inhaled.

H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P273: Avoid release to the environment.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statements

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/.... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)

P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 4. SRGO (Viscosity > 20.5 mm²/s at 40 °C; Flash point > 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Liver, spleen, bone marrow	H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Warning

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H332: Harmful if inhaled.

H373: May cause damage to liver, spleen and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statements

Prevention:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/....
(Manufacturer/supplier to specify type of equipment.).

Response:

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P314: Get medical advice/attention if you feel unwell.

P391: Collect spillage.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CRACKED GAS OILS (CRACKEDGO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. CrackedGO) must be applied.

C&L drivers	C&L permutation
Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$	CLP 1. CrackedGO
Flash point $> 75^{\circ}\text{C}$	CLP 2. CrackedGO

CRACKED GAS OILS		
EC #	CAS #	Acceptable C&L permutations
265-060-4	64741-59-9	CLP 1, CLP 2
265-062-5	64741-60-2	CLP 1, CLP 2
265-084-5	64741-82-8	CLP 1, CLP 2
295-411-7	92045-29-9	CLP 1, CLP 2

CLP 1. CrackedGO (Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (...*Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (...*in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. CrackedGO (Flash point > 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS (VHGO)

Although Part 3 of Annex VI of CLP includes Note N

("The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.") for the VHGO substance with EC 269-822-7, this Note is not applied in any of the C&L permutations and, therefore, all VHGO substances are classified as Carcinogenic Cat. 2.

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. VHGO) must be applied.

C&L drivers		C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$	CLP 1. VHGO
	Flash point $> 75^\circ\text{C}$	CLP 2. VHGO
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$	CLP 3. VHGO
	Flash point $> 75^\circ\text{C}$	CLP 4. VHGO

VACUUM GAS OILS, HYDROCRACKED GAS OILS & DISTILLATE FUELS		
EC #	CAS #	Acceptable C&L permutations
265-049-4	64741-49-7	CLP 1, CLP 2, CLP 3, CLP 4
265-059-9	64741-58-8	CLP 1, CLP 2, CLP 3, CLP 4
265-078-2	64741-77-1	CLP 1, CLP 2, CLP 3, CLP 4
269-822-7	68334-30-5	CLP 1, CLP 2
270-671-4	68476-30-2	CLP 1, CLP 2, CLP 4
270-673-5	68476-31-3	CLP 1, CLP 2
270-676-1	68476-34-6	CLP 1

CLP 1. VHGO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $\geq 23^\circ\text{C}$ and $\leq 75^\circ\text{C}$)

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Thymus, liver, bone marrow	H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^\circ\text{C}$ and $\leq 75^\circ\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. VHGO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C ; Flash point $> 75^\circ\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Thymus, liver, bone marrow	H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. VHGO (Viscosity > 20.5 mm²/s at 40 °C; Flash point ≥ 23 °C and ≤ 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Thymus, liver, bone marrow	H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between ≥ 55 °C and ≤ 75 °C may be regarded as Category 3.

Labelling

Signal word: Warning

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P332 + P313: If skin irritation occurs: Get medical advice/attention.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (... *Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...*Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 4. VHGO (Viscosity > 20.5 mm²/s at 40 °C; Flash point > 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Thymus, liver, bone marrow	H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Warning

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H315: Causes skin irritation.

H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to thymus, liver and bone marrow through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

OTHER GAS OILS (OTHERGO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. OtherGO) must be applied.

C&L drivers		C&L permutation
Carcinogenic or unknown feed-stock	Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$	CLP 1. OtherGO
	Flash point $> 75^{\circ}\text{C}$	CLP 2. OtherGO
Non-carcinogenic feed-stock	Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$	CLP 3. OtherGO
	Flash point $> 75^{\circ}\text{C}$	CLP 4. OtherGO

OTHER GAS OILS		
EC #	CAS #	Acceptable C&L permutations
265-148-2	64742-46-7	CLP 1, CLP 2, CLP 3, CLP 4
265-182-8	64742-79-6	CLP 1, CLP 2, CLP 3, CLP 4
265-183-3	64742-80-9	CLP 1, CLP 2, CLP 3, CLP 4

CLP 1. OtherGO (Carcinogenic or unknown feed-stock; Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P314: Get medical advice/attention if you feel unwell.
P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. OtherGO (Carcinogenic or unknown feed-stock; Flash point > 75 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.

H350: May cause cancer.

H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 3. OtherGO (Non-carcinogenic feed-stock; Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$)

The following Note has been applied:

Note N -

"The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class."

The following Oil Industry Note (OIN) has been applied:

- OIN 14 - The classification as a specific target organ toxicant category 2; H373 (May cause damage to organs through prolonged or repeated exposure) needs not apply if the substance is not classified as carcinogenic.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Full list of Precautionary statementsPrevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (*...Manufacturer/supplier to specify appropriate media. – if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 4. OtherGO (Non-carcinogenic feed-stock; Flash point > 75 °C)

The following Note has been applied:

Note N -

"The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class."

- The following Oil Industry Note (OIN) has been applied:
- OIN 14 - The classification as a specific target organ toxicant category 2; H373 (May cause damage to organs through prolonged or repeated exposure) needs not apply if the substance is not classified as carcinogenic.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H332: Harmful if inhaled.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

Full list of Precautionary statements

Prevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)

P331: Do NOT induce vomiting.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

HEAVY FUEL OIL COMPONENTS (HFO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. HFO) must be applied.

C&L drivers	C&L permutation
Viscosity \leq 20.5 mm ² /s at 40 °C	CLP 1. HFO
Viscosity > 20.5 mm ² /s at 40 °C	CLP 2. HFO

HEAVY FUEL OIL COMPONENTS		
EC #	CAS #	Acceptable C&L permutations
265-045-2	64741-45-3	CLP 1, CLP 2
265-058-3	64741-57-7	CLP 1, CLP 2
265-063-0	64741-61-3	CLP 1, CLP 2
265-064-6	64741-62-4	CLP 1, CLP 2
265-069-3	64741-67-9	CLP 1, CLP 2
265-076-1	64741-75-9	CLP 1, CLP 2
265-081-9	64741-80-6	CLP 1, CLP 2
265-082-4	64741-81-7	CLP 1, CLP 2
265-162-9	64742-59-2	CLP 1, CLP 2
265-181-2	64742-78-5	CLP 2
265-189-6	64742-86-5	CLP 1, CLP 2
269-777-3	68333-22-2	CLP 1, CLP 2
270-675-6	68476-33-5	CLP 1, CLP 2
270-796-4	68478-17-1	CLP 1, CLP 2
270-984-6	68512-62-9	CLP 1, CLP 2
271-384-7	68553-00-4	CLP 2
271-763-7	68607-30-7	CLP 1, CLP 2
272-184-2	68783-08-4	CLP 1, CLP 2
273-263-4	68955-27-1	CLP 1, CLP 2
274-684-6	70592-77-7	CLP 1, CLP 2
274-685-1	70592-78-8	CLP 1, CLP 2
292-658-2	90669-76-4	CLP 2
295-396-7	92045-14-2	CLP 2
295-511-0	92061-97-7	CLP 1, CLP 2
298-754-0	93821-66-0	CLP 1, CLP 2

CLP 1. HFO (Viscosity \leq 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

Hazard class	Hazard category	Hazard statement
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H332: Harmful if inhaled.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P314: Get medical advice/attention if you feel unwell.
P331: Do NOT induce vomiting.
P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 2. HFO (Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 2 Affected organs: Blood, thymus, liver	H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Hazards to the aquatic environment (acute/short-term):	Aquatic Acute 1	H400: Very toxic to aquatic life (M-Factor =1).
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H332: Harmful if inhaled.
H350: May cause cancer.
H361d: Suspected of damaging the unborn child.

H373: May cause damage to blood, thymus and liver through prolonged or repeated exposure.

H410: Very toxic to aquatic life with long lasting effects (M-Factor =1).

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P314: Get medical advice/attention if you feel unwell.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

UNREFINED / ACID TREATED OILS (UATO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. UATO) must be applied.

C&L drivers	C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 1. UATO
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 2. UATO

UNREFINED / ACID TREATED OILS		
EC #	CAS #	Acceptable C&L permutations
265-051-5	64741-50-0	CLP 1, CLP 2
265-052-0	64741-51-1	CLP 1, CLP 2

CLP 1. UATO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1A	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1A.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. UATO (Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1A	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



GHS09: environment



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1A.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. *(Manufacturer/supplier to specify applicable conditions.)*

P264: Wash ... thoroughly after handling. *(Manufacturer/supplier to specify parts of the body to be washed after handling.)*

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... *(Manufacturer/supplier to specify type of equipment.)*

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... *(... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)*

HIGHLY REFINED BASE OILS (HRBO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. HRBO) must be applied.

C&L drivers	C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 1. HRBO
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 2. HRBO

HIGHLY REFINED BASE OILS		
EC #	CAS #	EC name
232-455-8	8042-47-5	CLP 1, CLP 2

CLP 1. HRBO (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

Precautionary statements:

P102: Keep out of reach of children. (In case of consumer use P102 should be added on the label) *

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P405: Store locked up. *

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

*This P-statement is not automatically triggered by the classification and labelling rules for these substances, however based on its physical chemical properties having a viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ @ 40°C it is advised when used in consumer products.

Full list of Precautionary statements

General:

P102: Keep out of reach of children. *(In case of consumer use P102 should be added on the label) **

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up. *

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

***This P-statement is not automatically triggered by the classification and labelling rules for these substances, however based on its physical chemical properties having a viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ @ 40°C it is advised when used in consumer products. CLP 2. HRBO (Viscosity > $20.5 \text{ mm}^2/\text{s}$ at 40°C)**

The substance is not classified.

OTHER LUBRICANT BASE OILS (LBO)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. LBO) must be applied.

C&L drivers		C&L permutation
IP 346 $\geq 3\%$ w/w	Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 1. LBO
	Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 2. LBO
IP 346 $< 3\%$ w/w	Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 3. LBO
	Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 4. LBO

OTHER LUBRICANT BASE OILS		
EC #	CAS #	Acceptable C&L permutations
265-077-7	64741-76-0	CLP 1, CLP 3, CLP 4
265-090-8	64741-88-4	CLP 1, CLP 2, CLP 3, CLP 4
265-091-3	64741-89-5	CLP 3, CLP 4
265-096-0	64741-95-3	CLP 2, CLP 3, CLP 4
265-097-6	64741-96-4	CLP 2, CLP 4
265-101-6	64742-01-4	CLP 3, CLP 4
265-155-0	64742-52-5	CLP 2, CLP 3, CLP 4
265-156-6	64742-53-6	CLP 1, CLP 3, CLP 4
265-157-1	64742-54-7	CLP 2, CLP 3, CLP 4
265-158-7	64742-55-8	CLP 1, CLP 3, CLP 4
265-159-2	64742-56-9	CLP 1, CLP 3, CLP 4
265-160-8	64742-57-0	CLP 2, CLP 4
265-166-0	64742-62-7	CLP 3, CLP 4
265-169-7	64742-65-0	CLP 3, CLP 4
265-174-4	64742-70-7	CLP 3, CLP 4

OTHER LUBRICANT BASE OILS		
EC #	CAS #	Acceptable C&L permutations
265-176-5	64742-71-8	CLP 3, CLP 4
276-736-3	72623-85-9	CLP 3, CLP 4
276-737-9	72623-86-0	CLP 3, CLP 4
276-738-4	72623-87-1	CLP 3, CLP 4
278-012-2	74869-22-0	CLP 3, CLP 4

CLP 1. LBO (IP 346 \geq 3% w/w; Viscosity \leq 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (Manufacturer/supplier to specify applicable conditions.)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. LBO (IP 346 \geq 3% w/w; Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard

Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by dermal route.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. LBO (IP 346 < 3% w/w; Viscosity ≤ 20.5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346 "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method", Institute of Petroleum, London. This note applies only to certain complex oil-derived substances in Part 3.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

Precautionary statements:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P331: Do NOT induce vomiting.

Full list of Precautionary statements

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...Manufacturer/supplier to specify the appropriate source of emergency medical advice.)
P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

CLP 4. LBO (IP 346 < 3% w/w; Viscosity > 20.5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346 "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method", Institute of Petroleum, London. This note applies only to certain complex oil-derived substances in Part 3.

Classification and labelling according to CLP / GHS

The substance is not classified.

UNTREATED DISTILLATE AROMATIC EXTRACTS (UDAE)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. UDAE) must be applied.

C&L drivers	C&L permutation
Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 1. UDAE
Viscosity $> 20.5 \text{ mm}^2/\text{s}$ at 40°C	CLP 2. UDAE

UNTREATED DISTILLATE AROMATIC EXTRACTS		
EC #	CAS #	Acceptable C&L permutations
265-103-7	64742-04-7	CLP 1, CLP 2
265-104-2	64742-05-8	CLP 1, CLP 2

CLP 1. UDAE (Viscosity $\leq 20.5 \text{ mm}^2/\text{s}$ at 40°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. UDAE (Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



GHS09: environment



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

TREATED DISTILLATE AROMATIC EXTRACTS (TDAE)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. TDAE) must be applied.

C&L drivers		C&L permutation
IP 346 \geq 3% w/w	Viscosity \leq 20.5 mm ² /s at 40°C	CLP 1. TDAE
	Viscosity $>$ 20.5 mm ² /s at 40°C	CLP 2. TDAE
IP 346 $<$ 3% w/w	Viscosity \leq 20.5 mm ² /s at 40°C	CLP 3. TDAE
	Viscosity $>$ 20.5 mm ² /s at 40°C	CLP 4. TDAE

TREATED DISTILLATE AROMATIC EXTRACTS		
EC #	CAS #	Acceptable C&L permutations
272-180-0	68783-04-0	CLP 1, CLP 2, CLP 3, CLP 4

CLP 1. TDAE (IP 346 \geq 3% w/w, Viscosity \leq 20.5 mm²/s at 40°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. TDAE (IP 346 \geq 3% w/w, Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. TDAE (IP 346 < 3% w/w, Viscosity ≤ 20.5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346 "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method", Institute of Petroleum, London. This note applies only to certain complex oil-derived substances in Part 3.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

Precautionary statements:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

EUH066: Repeated exposure may cause skin dryness or cracking.

Full list of Precautionary statementsResponse:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 4. TDAE (IP 346 < 3% w/w, Viscosity > 20.5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346 "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method", Institute of Petroleum, London. This note applies only to certain complex oil-derived substances in Part 3.

Classification and labelling according to CLP / GHS

The substance is not classified.

RESIDUAL AROMATIC EXTRACTS (RAE)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. RAE) must be applied.

C&L drivers	C&L permutation
Mutagenicity Index ≥ 0.4	CLP 1. RAE
Mutagenicity Index < 0.4	CLP 2. RAE

RESIDUAL AROMATIC EXTRACTS		
EC #	CAS #	Acceptable C&L permutations
265-110-5	64742-10-5	CLP 1, CLP 2

CLP 1. RAE (Mutagenicity Index ≥ 0.4)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Carcinogenicity:	Carc. 2	H351: Suspected of causing cancer.

Labelling

Signal word: Warning

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H351: Suspected of causing cancer.

Precautionary statements:

P201: Obtain special instructions before use.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.)

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. RAE (Mutagenicity Index < 0.4)

The following Oil Industry Note (OIN) has been applied:

- OIN 10 - The classification as a carcinogen needs not apply if it can be shown that the substance has mutagenicity index (MI) less than 0.4 as measured by the test method described in ASTM E 1687-04 or if another predictive test demonstrates the substance is not a carcinogen.

Classification and labelling according to CLP / GHS

The substance is not classified.

SLACK WAXES (SLACKWAX)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. Slackwax) must be applied.

C&L drivers	C&L permutation
Carcinogenic or unknown feed-stock	CLP 1. Slackwax
Non-carcinogenic feed-stock	CLP 2. Slackwax

SLACK WAXES		
EC #	CAS #	Acceptable C&L permutations
265-165-5	64742-61-6	CLP 2
292-660-3	90669-78-6	CLP 2
295-523-6	92062-09-4	CLP 2

CLP 1. Slackwax (Carcinogenic or unknown feed-stock)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal route.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal route.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. Slackwax (Non-carcinogenic feed-stock)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note N - The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

The substance is not classified.

PARAFFIN AND HYDROCARBON WAXES (PARAFFINWAX)

There is one single C&L Permutation for Paraffinwax substances.

PARAFFIN AND HYDROCARBON WAXES		
EC #	CAS #	Acceptable C&L permutations
232-315-6	8002-74-2	CLP 1
264-038-1	63231-60-7	CLP 1
265-144-0	64742-42-3	CLP 1
265-145-6	64742-43-4	CLP 1
265-154-5	64742-51-4	CLP 1
265-163-4	64742-60-5	CLP 1

CLP 1. Paraffinwax

Classification and labelling according to CLP / GHS

The substance is not classified.

FOOTS OILS (FOOTSOIL)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. Footsoil) must be applied.

C&L drivers		C&L permutation
IP 346 \geq 3% w/w	Viscosity \leq 20.5 mm ² /s at 40°C	CLP 1. Footsoil
	Viscosity $>$ 20.5 mm ² /s at 40°C	CLP 2. Footsoil
IP 346 $<$ 3% w/w	Viscosity \leq 20.5 mm ² /s at 40°C	CLP 3. Footsoil
	Viscosity $>$ 20.5 mm ² /s at 40°C	CLP 4. Footsoil

FOOTS OILS		
EC #	CAS #	Acceptable C&L permutations
265-171-8	64742-67-2	CLP 3, CLP 4
295-394-6	92045-12-0	CLP 3, CLP 4

CLP 1. Footsoil (IP 346 \geq 3% w/w; Viscosity \leq 20.5 mm²/s at 40°C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. Footsoil (IP 346 \geq 3% w/w; Viscosity > 20.5 mm²/s at 40 °C)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Reproductive Toxicity:	Repr. 2 Specific effect: Unborn child	H361d: Suspected of damaging the unborn child.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.
Specific target organ toxicity - repeated exposure:	STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, liver, lymph nodes, kidney, stomach, thymus	H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H372: Causes damage to adrenals, bone marrow, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statements

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 3. Footsoil (IP 346 < 3% w/w; Viscosity ≤ 20,5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 3% of dimethyl sulphoxide extract as measured by IP 346 ('Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method' Institute of Petroleum, London), in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H304: May be fatal if swallowed and enters airways.

Precautionary statements:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Full list of Precautionary statementsResponse:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (...*Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P331: Do NOT induce vomiting.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 4. Footsoil (IP 346 < 3% w/w; Viscosity > 20.5 mm²/s at 40 °C)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note L - The harmonised classification as a carcinogen applies unless it can be shown that the substance contains less than 3% of dimethyl sulphoxide extract as measured by IP 346 ('Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions - Dimethyl sulphoxide extraction refractive index method' Institute of Petroleum, London), in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

The substance is not classified.

PETROLATUMS (PETROLATUM)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. Petrolatum) must be applied.

C&L drivers	C&L permutation
Carcinogenic or unknown feed-stock	CLP 1. Petrolatum
Non-carcinogenic feed-stock	CLP 2. Petrolatum

PETROLATUMS		
EC #	CAS #	Acceptable C&L permutations
232-373-2	8009-03-8	CLP 2

CLP 1. Petrolatum (Carcinogenic or unknown feed-stock)

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement	
Reproductive Toxicity:		Repr. 2 Specific effect: Unborn child Route of exposure: Dermal	H361d: Suspected of damaging the unborn child by dermal route.
Carcinogenicity:	Carc. 1B	H350: May cause cancer.	
Specific target organ toxicity - repeated exposure:		STOT Rep. Exp. 1 Affected organs: Adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach, thymus Route of exposure: Oral and dermal	H372: Causes damage to adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

Labelling

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



Hazard statements:

H350: May cause cancer.

H361d: Suspected of damaging the unborn child by dermal route.

H372: Causes damage to adrenals, bone marrow, blood, liver, lymph nodes, kidney, stomach and thymus through prolonged or repeated exposure by oral and dermal routes.

Precautionary statements:

P201: Obtain special instructions before use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

Additional labelling requirements:

Restricted to professional users due to classification as carcinogenic Category 1B.

Full list of Precautionary statementsPrevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)

P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)

P270: Do not eat, drink or smoke when using this product.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified).*)

CLP 2. Petrolatum (Non-carcinogenic feed-stock)

The following Oil Industry Note (OIN) has been applied:

- OIN 8 - The classifications as a reproductive toxicant category 2; H361d (Suspected of damaging the unborn child) and specific target organ toxicant category 1; H372 (Causes damage to organs through prolonged or repeated exposure) need not apply if the substance is not classified as carcinogenic.

The following Note has been applied:

- Note N - The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class.

Classification and labelling according to CLP / GHS

The substance is not classified.

BITUMENS (BITUMEN)

There is one single C&L Permutation for Bitumen substances.

BITUMENS		
EC #	CAS #	Acceptable C&L permutations
232-490-9	8052-42-4	CLP 1
265-057-8	64741-56-6	CLP 1
295-518-9	92062-05-0	CLP 1

CLP 1. Bitumen

Classification and labelling according to CLP / GHS

The substance is not classified.

OXIDIZED ASPHALT (OXIASPH)

There is one single C&L Permutation for OxiAsph.

OXIDIZED ASPHALT		
EC #	CAS #	Acceptable C&L permutations
265-196-4	64742-93-4	CLP 1

CLP 1. OxiAsph

Classification and labelling according to CLP / GHS

The substance is not classified.

SULFUR (SULFUR)

There is one single C&L permutation for Sulfur.

SULFUR		
EC #	CAS #	Acceptable C&L permutations
231-722-6	7704-34-9	CLP 1

CLP 1. Sulfur

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.

Labelling

Signal word: Warning

Hazard pictogram:

GHS07: exclamation mark



Hazard statements:

H315: Causes skin irritation.

Precautionary statements:

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

Full list of Precautionary statements

Prevention:

P264: Wash ... thoroughly after handling. (Manufacturer/supplier to specify parts of the body to be washed after handling.)

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (Manufacturer/supplier to specify type of equipment.)

Response:

P302 + P352: IF ON SKIN: Wash with plenty of water/... (...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.)

P321: Specific treatment (see ... on this label). (... Reference to supplemental first aid instruction.)

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

RENEWABLE DEOXYGENATE DIESEL (RENEWDD)

The Table below should be used to find the applicable C&L permutation according to the values of the relevant C&L drivers determined by each manufacturer/supplier; in the absence of information on the C&L drivers, the worst-case classification (permutation CLP 1. RenewDD) must be applied.

C&L drivers		C&L permutation
Non-carcinogenic feed-stock	Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$	CLP 1. RenewDD
	Flash point $> 75^{\circ}\text{C}$	CLP 2. RenewDD

RENEWABLE DEOXYGENATE DIESEL		
EC #	CAS #	Acceptable C&L permutations
951-915-5		CLP 1, CLP 2

CLP 1. RenewDD (Non-carcinogenic feed-stock; Flash point $\geq 23^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$)

The following Note has been applied:

Note N -

"The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class."

The following Oil Industry Note (OIN) has been applied:

- OIN 14 - The classification as a specific target organ toxicant category 2; H373 (May cause damage to organs through prolonged or repeated exposure) needs not apply if the substance is not classified as carcinogenic.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Flammable liquids:	Flam. Liquid 3 *	H226: Flammable liquid and vapour.
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

* For the purpose of CLP gas oils, diesel and light heating oils having a flash point between $\geq 55^{\circ}\text{C}$ and $\leq 75^{\circ}\text{C}$ may be regarded as Category 3.

Labelling

Signal word: Danger

Hazard pictogram:

GHS02: flame



GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Full list of Precautionary statements

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment. (*... Manufacturer/supplier to specify other equipment.*)
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)

P321: Specific treatment (see ... on this label). (... *Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use ... to extinguish. (...*Manufacturer/supplier to specify appropriate media.*
– *if water increases risk.*)
P391: Collect spillage.

Storage:

P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (... *in accordance with local/regional/national/international regulation (to be specified).* *Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

CLP 2. RenewDD (Non-carcinogenic feed-stock; Flash point > 75 °C)

The following Note has been applied:

Note N -

"The harmonised classification as a carcinogen applies unless the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen, in which case a classification in accordance with Title II of this Regulation shall be performed also for that hazard class."

- The following Oil Industry Note (OIN) has been applied:
- OIN 14 - The classification as a specific target organ toxicant category 2; H373 (May cause damage to organs through prolonged or repeated exposure) needs not apply if the substance is not classified as carcinogenic.

Classification and labelling according to CLP / GHS

Hazard class	Hazard category	Hazard statement
Acute toxicity - inhalation:	Acute Tox. 4	H332: Harmful if inhaled.
Skin corrosion / irritation:	Skin Irrit. 2	H315: Causes skin irritation.
Aspiration hazard:	Asp. Tox. 1	H304: May be fatal if swallowed and enters airways.
Hazards to the aquatic environment (chronic/long-term):	Aquatic Chronic 2	H411: Toxic to aquatic life with long lasting effects.

Labelling

Signal word: Danger

Hazard pictogram:

GHS07: exclamation mark



GHS08: health hazard



GHS09: environment



Hazard statements:

H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P331: Do NOT induce vomiting.

Full list of Precautionary statementsPrevention:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray. (*Manufacturer/supplier to specify applicable conditions.*)
P264: Wash ... thoroughly after handling. (*Manufacturer/supplier to specify parts of the body to be washed after handling.*)
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... (*Manufacturer/supplier to specify type of equipment.*)

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor/... (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P302 + P352: IF ON SKIN: Wash with plenty of water/... (*...Manufacturer/supplier may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate.*)
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTRE/doctor/... if you feel unwell. (*...Manufacturer/supplier to specify the appropriate source of emergency medical advice.*)
P321: Specific treatment (see ... on this label). (*... Reference to supplemental first aid instruction.*)
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ... (*... in accordance with local/regional/national/international regulation (to be specified). Manufacturer/supplier to specify whether disposal requirements apply to contents, container or both.*)

APPENDIX 7: HISTORICAL CONTENT OUTLINING THE CHANGES FROM PREVIOUS LEGISLATION TO THE CLP REGULATION

Two key regulatory instruments which set out the long standing EU system on classification, packaging and labelling of chemicals have been developed over the last 50 years:

- Dangerous Substances Directive (67/548/EEC), ‘DSD’ (EU, 1967);
- Dangerous Preparations (i.e. mixtures of chemicals) Directive (1999/45/EC), ‘DPD’ (EU, 1999)

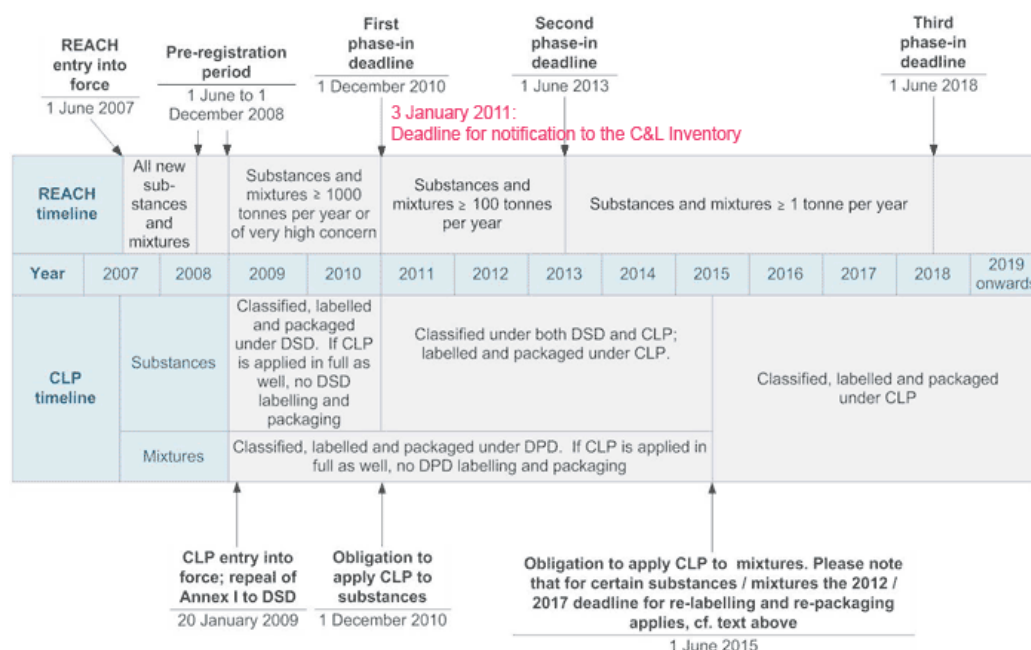
CLP (EU, 2008) was introduced alongside the REACH regulation (EU, 2006) which entered into force on 1st of June 2007 consolidating the former legislative framework on chemicals of the EU. Although REACH does not include criteria for classification and labelling, it referred to the above EC Directives and CLP. Furthermore elements of REACH, such as registration and supply chain communication together with the classification and labelling inventory (now part of CLP), are driven by hazard classification.

In terms of timing, the provisions of CLP were subject to a phased introduction. As from 1st June 2015, all hazard classifications are conducted under the provisions of CLP.

A further provision of CLP was that by 3rd of January 2011 industry had to send notifications of their classification and labelling of substances to the European Chemical Agency (ECHA). The notifications were incorporated into a Classification and Labelling Inventory (‘C&L Inventory’) made publicly available on ECHA’s website.

Mixtures classified, labelled and packaged in accordance with DPD and placed on the market before 1st of June 2015 were not required to be relabelled and repackaged in accordance with CLP until 1st of June 2017.

A schematic, summarising the key timelines arising from REACH and CLP is shown below:



Manufacturers and importers (or groups of manufacturers and importers) who placed hazardous substances on the market, also had to notify ECHA of certain information, in particular the substance identity and the classification and labelling of each hazardous substance, unless this information was already submitted as part of a registration dossier under REACH. ECHA then included the notified information in the C&L Inventory.

Implementation of CLP also impacted downstream legislation which relies on DSD and DPD hazard classifications. As a consequence, the EU was amending downstream legislation, such as that on worker safety, major accidents and consumer products.

REFERENCES

EU (2006) Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No. 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Official Journal of the European Union No. L396, 30.12.2006, as corrected by Official Journal of the European Union No. L136, 29.05.2007 and as further amended

EU (2008) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. Official Journal of the European Union No. L353, 31.12.2008 (Initial CLP) and as further amended

Concawe
Boulevard du Souverain 165
B-1160 Brussels
Belgium

Tel: +32-2-566 91 60
Fax: +32-2-566 91 81
e-mail: info@concawe.org
<http://www.concawe.eu>

ISBN 978-2-87567-176-9



9 782875 671769