

Update Dec 2016; changed annual use frequency reporting format

CONCAWE_SCED_13_8_a_v2: Fuels, Liquid, Lamp oil

Products/activities covered by the SCED:

Filling oil lamp indoors with fuel every week

Applicability of the SCED (depending on substances properties):

Determinant values refer to foots oil as the fuel

Exposure Descriptor or Determinant	Value
SCED characteristics	
Name of the SCEDs	<i>Fuels, Liquid, Lamp oil</i>
PC/AC descriptor	PC13
SCED code	CONCAWE_SCED_13_8_a_v2
Code of other related SCED	
Author	CONCAWE
Source of SCED	http://www.concawe.org
Physical form of the product	Liquids
User characteristics	
Adult/child assumed	Covers adult use
Common parameters	
Concentration of substance in mixture (g/g)	1
Explanations	>99% of formulated product is the substance
Frequency of use over a day (event/day)	1
Rationale	Unchanged from ECETOC TRA default value
Frequency of use over a year (times/year)	52
Rationale	Once/week;
Dermal Specific Parameters	
Exposure via dermal route	Yes
Rationale	
Skin Contact Area	Palm of one hand.
Rationale	Only inside of one hand expected to hold fuel container when refuelling.
Dermal transfer factor	0.005
Rationale	Estimated conservative value based on a comparison with values available for handling lubricants where <0.001% of product is transferred to the skin.
Inhalation Specific Parameters	
Exposure via inhalation route	Yes
Rationale	
Spray application?	No
Amount of Product used per application (g/event)	255
Rationale	Based on an upper end lamp reservoir volume of 0.3 L and density of 850 g/L.
Exposure Time per event (hr)	0.017
Rationale	Estimated 1 min due to small volume being transferred. TRA default time is 4 hr [1].
Inhalation transfer factor	0.05

Exposure Descriptor or Determinant	Value
Rationale	Only low evaporative losses likely but percentage increased as compared to lubricant refuelling.
Place of use	Indoor
Oral Specific Parameters	
Exposure via oral route	Oral exposure assumed to be negligible.
Rationale	Direct oral contact will only arise from intentional ingestion of the product. Significant indirect contact is unlikely due to volatility of substance.
Volume swallowed (cm3)	N/a
Rationale	
Oral transfer Factor	N/a
Rationale	

CONCAWE_SCED_13_8_a_v2: Supporting Explanation

Consumers can potentially be exposed to lamp oils through inhalation from vapour evaporation/displacement or dermal contact from spillage when they are refuelling their lamp. Specific changes to the TRA defaults to better represent the scenario in reality while maintaining a conservative exposure prediction included the increase of the product ingredient from ECETOC TRA defaults and assumptions of refuelling a lamp every week.

Exposure Descriptor or Determinant	Value	Rationale
Product Characteristics		
Volatility (Pa)	5	Typically 5 Pa at 20 °C (source product's SDSs)
Product Ingredient Fraction (by weight)	1	Increased above ECETOC TRA default (0.5) for fuel – liquids [2].
Frequency of Use (events/day), value <1 indicates infrequent (less than daily) use *	0.14	Once/week; consistent with the 90 th percentile of 5 times per month (0.17) and average of 3.1 times per month (0.1) in a recent survey [6]. These data suggest lower values than the TRA default of 1 (daily refuelling) [2].
Dermal Specific Parameters		
Skin Contact Area (cm ²)	210	Palm of one hand as only one hand holds the refuelling container. It is less than TRA default (two hands): 857.5 cm ² [2].
Dermal Transfer Factor**	0.005	This value is greater (more conservative) than the <0.001% of material handled that has been measured as being transferred onto the skin when filling a car engine with lubricants [5]. It should be noted that this compares with the value estimated (0.003) for a dermal scenario while changing the oil in a car in US EPA E-FAST (based on the film thickness of 0.0119 cm and surface area of 2 hands (480 cm ²), i.e. the amount contact with skin is estimated to be 5 g) [4]. Estimated based on low volatility and potential contact with incidental drips from pouring activity. These estimates have been shown to be conservative in consumer simulations of the use [5].
Inhalation Specific Parameters		
Amount of Product used per application (g)	255	Based on 0.3 L and density of 850 g/L [1, 3]. (fuel capacity ranges from 2.5 to 12 oz (≈ 0.08 to 0.39 L) based on product manufacturers [3]. The lamp with larger fuel capacity will last longer and needs to be refuelled less frequently than the one with small fuel capacity. For example, the 2.5 oz lamp can be used for 8 hr and the 12 oz lamp can be used up to 20 hr). These observations indicate a lower use.
Exposure Time (hr)	0.017	Estimated 1 min due to small volume being transferred. TRA default time is 4 hr [2].
Is product used outdoors only?	No	
Room Volume (m ³)	20	The TRA default is 20 m ³ [2].
Ventilation specified or likely due to properties (e.g. odour,	0.6	TRA default [2] for an indoor room without ventilation.

Exposure Descriptor or Determinant	Value	Rationale
etc.)- if so what type – (open window, fan)		
Inhalation transfer factor (fraction of total amount handled lost to air)	0.005	Based on its MSDS, the vapour pressure is very low and the expected loss of volatile material will be negligible from an open container. Also, the fuel transfer will not be expected to result in aerosol exposure. An inhalation factor consistent with that for diesel refuelling is therefore applied.
Oral Specific Parameters		
	N/a	Direct oral contact will only arise from intentional ingestion of the product. Significant indirect contact is unlikely.

* A frequency of <1 is used for chronic exposure assessments. Exposure for the day of use would still be based upon a value of 1 or greater (if the default suggests multiple uses occur in a single day).

** Dermal transfer factor (DTF) represents the % of total amount handled that is transferred to the skin. If this factor is being applied in a tool with an algorithm that uses skin surface area and the thickness of the layer to calculate dermal loading, such as ECETOC TRA v3, the DTF would need to be adjusted so that the final dermal loading remains the same as when the DTF is applied to the total amount.

References:

1. Footh oil (M)SDS
<http://www.setonresourcecenter.com/msdshazcom/htdocs/MSDS/E/exxon/wcd0019a.htm>
2. ECETOC (2014) ECETOC Targeted Risk Assessment (TRA) Tool, version3.1. Brussels: European Centre for Ecotoxicology and Toxicology of Chemicals (available at: <http://www.ecetoc.org/tra>)
3. Oil lamp fuel capacity: http://www.delite.dk/essorensen/oil_lamps.html
4. US EPA (2007) Exposure and fate Assessment screening tool (E-FAST). Washington DC: US Environmental Protection Agency. Available at: <http://www.epa.gov/oppt/exposure/pubs/efastdl.htm>
5. Galea K. et al (2013) Determination of the potential for dermal exposure from transfer of lubricants and fuels by consumers. IOM report TM/13/03. Edinburgh: Institute of Occupational Medicine. (available at http://www.iom-world.org/media/106928/iom_tm1303.pdf)
6. CONCAWE (2014) Use of motor fuels and lubricants: habits and practices of consumers in Europe. Report No. 4/14. Brussels: CONCAWE