

Update Dec 2016; changed annual use frequency reporting format

## CONCAWE\_SCED\_13\_6\_a\_v2: Fuels, gas, Home space heater

**Products/activities covered by the SCED:**

Changing compressed gas cylinder to indoor space heater every week

**Applicability of the SCED (depending on substances properties):**

Determinant values refer to LPG as the fuel

Exposure Descriptor or Determinant	Value
<b>SCED characteristics</b>	
Name of the SCEDs	<i>Fuels, gas, home space heater</i>
PC/AC descriptor	PC13
SCED code	CONCAWE_SCED_13_6_a_v2
Code of other related SCED	
Author	CONCAWE
Source of SCED	<a href="http://www.concawe.org">http://www.concawe.org</a>
Physical form of the product	Gas
<b>User characteristics</b>	
Adult/child assumed	Covers adult use
<b>Common parameters</b>	
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
<b>Dermal Specific Parameters</b>	
Exposure via dermal route	No
Rationale	Substance is a gas. If dermal contact occurs then it will result in cold burns.
Skin Contact Area	N/a
Rationale	
Dermal transfer factor	N/a
Rationale	
<b>Inhalation Specific Parameters</b>	
Exposure via inhalation route	Yes
Rationale	
Spray application?	No
Amount of Product used per application (g/event)	15000
Rationale	Based on a typical 15 kg domestic gas cylinder
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	0.0005
Rationale	Only low evaporative losses likely but percentage increased as compared to lubricant refuelling to be
Place of use	Indoor

Exposure Descriptor or Determinant	Value
<b>Oral Specific Parameters</b>	
<b>Exposure via oral route</b>	Oral exposure assumed to be negligible
<b>Rationale</b>	Oral contact cannot conceivably arise
<b>Volume swallowed (cm3)</b>	N/a
<b>Rationale</b>	
<b>Oral transfer Factor</b>	N/a
<b>Rationale</b>	

## CONCAWE\_SCED\_13\_6\_a\_v2: Supporting Explanation

Consumers can be exposed to LPG through inhalation from vapour evaporation/displacement when they are replacing the tank of a home space heater. 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 about dis/connecting the cylinder for a home space heater.

Exposure Descriptor or Determinant	Value	Rationale
<b>Product Characteristics</b>		
Volatility (Pa)	>133000	at 20 °C (source product's SDSs)
Product Ingredient Fraction (by weight)	1	Increased above ECETOC TRA default (0.5) for fuel – liquids [1]
Frequency of Use (events/day), value <1 indicates infrequent (less than daily) use *	0.14	Once/week; 15 kg LPG cylinder unlikely to be changed more than weekly in a domestic setting (based on typical substance burn time of c.140 hr [5])
<b>Dermal Specific Parameters</b>		
Skin Contact Area (cm <sup>2</sup> )	N/a	Substance is a gas. If dermal contact occurs then it will result in cold burns.
Dermal Transfer Factor**	N/a	
<b>Inhalation Specific Parameters</b>		
Amount of Product used per application (g)	15000	Based on typical domestic 15 kg cylinder. Larger cylinders are not routinely provided due to manual handling considerations (bulk, weight) [4]. This is greater than the TRA default of 5000 g [1].
Exposure Time (hr)	0.017	Estimated 1 minute as it takes much less time to swap out a gas cylinder than for liquids refuelling. In the liquids SCED, the exposure time (2 min) was set to be less than the 97 <sup>th</sup> percentile value for a vehicle refuelling time [2], i.e. typical handling practices are much lower than the TRA default of 4hr [1].
Is product used outdoors only?	No	
Room Volume (m <sup>3</sup> )	20	The TRA default is 20 m <sup>3</sup> [1].
Ventilation specified or likely due to properties (e.g. odour, etc.)- if so what type – (open window, fan)	0.6	TRA default [1] for an indoor room without ventilation.
Inhalation transfer factor (fraction of total amount handled lost to air)	0.0005	LPG cylinder connection via sealed pipework due to flammability considerations. Loss of substance anticipated to be very small. Read across from the auto refuelling with LPG. For vehicles, LPG re-fuelling is via a contained self-sealing nozzle due to flammability considerations. Hence, leakage on nozzle insertion and withdrawal is very low. The factor utilized is intended to be conservative, and is greater than that estimated from US Federal Transit Administration [3] emission limits of 0.15 g/gallon of LPG dispensed (<0.0001).
<b>Oral Specific Parameters</b>		

Exposure Descriptor or Determinant	Value	Rationale
	N/a	Oral contact cannot conceivably arise

\* 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. 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>)
2. Vainiotalo, S. et al (1999) Customer exposure to MTBE, TAME, C6 Alkyl methyl ethers, and benzene during gasoline refueling. *Environ Health Perspect* 107, 2, 133-140
3. Jenks C.W. (1998) Technology assessment of refueling-connection devices for CNG, LNG, and Propane: Transportation Research Board, National Research Council. Washington DC: Transit Cooperative Research Program
4. HSE (2009) LPG cabinet space heaters and the requirements of gas safety legislation. Technical bulletin 065. London: Health and Safety Executive. Available at: <http://www.hse.gov.uk/gas/landlords/1-april-2009-tb-065-lpg-cabinet-space-heaters-and-the-requirements-of-gas-safety-legislation.pdf>
5. <http://www.calor.co.uk/shop/in-the-home/portable-gas-heaters/calor-heat-portable-heater.html>