

# SAFETY DATA SHEET

According to Regulation (EC) No.1907/2006

  
HARP  
INTERNATIONAL

## HARP® DME

Version: CLP01

Date: Aug 2011

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### 1. Identification of the substance / preparation and company / undertaking

<b>Product name</b>	Harp® DME
<b>REACH registration number</b>	01-2119472128-37-0000
<b>Company</b>	Harp International Ltd Gellihirion Industrial Estate Pontypridd Rhondda Cynon Taff CF37 5SX Tel: +44 (0) 1443 842255 Fax: +44 (0) 1443 841805 Email: harp@harpintl.com
<b>Emergency phone number</b>	+44 (0) 1270 502891 (24 hour)
<b>Use</b>	Aerosol propellant

### 2. Hazards identification

#### EC Classification of the substance or mixture

**Hazard Class & category code:**

**Regulation (EC) No. 1272/2008 (CLP):**

- Physical hazards

Flammable gases - Category 1 – Extremely flammable gas (H220)  
Gases under pressure - Contains gas under pressure; may explode if heated (H280)

**Classification EC67/548 or EC 1999/45** : R12 – Extremely flammable.

#### Label Elements

**Labelling Regulation EC 1272/2008 (CLP)**

- Hazard pictogram(s)



GHS02



GHS04

- Hazard pictograms code**
- Signal word**
- Hazard statements**

GHS02 (Flame) - GHS04 (Gas cylinder).

Danger

H220 : Extremely flammable gas

H280 : Contains gas under pressure; may explode if heated.

- Precautionary statements**

**-Prevention**

P210 : Keep away from heat/sparks/open flames/hot surfaces - No smoking.

**-Response**

P377 : Leaking gas fire : Do not extinguish unless leak can be stopped safely.

P381 : Eliminate all ignition sources if safe to do so.

**-Storage**

P403 : Store in a well ventilated place.

P410 : Protect from sunlight.

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## 2. Hazards identification continued

**Labelling EC 67/548 or EC 1999/45**

**Symbol(s)**

F+ : Extremely flammable.



**R Phrase(s)**

R12 : Extremely flammable.

**S Safety phrase(s)**

S9 : Keep container in a well-ventilated place.

S16 : Keep away from sources of ignition.

**Other hazards**

This substance is not considered to be persistent., bio-accumulating nor toxic (PBT).

This substance is not considered to be very persistent., nor very bio-accumulating nor toxic (vPvB).

May form explosive peroxides.

Rapid evaporation of the liquid may cause frostbite.

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

May cause cardiac arrhythmia.

## 3. Composition / information on ingredients

**Substance / Preparation**

Substance.

**Chemical name**

Dimethyl ether.

**Chemical formula**

(CH<sub>3</sub>)<sub>2</sub>O

Substance name	Contents	CAS no.	EC No	Registration no.	Classification According to Directive 67/548/EEC	Classification According to Regulation 1272/2008 (CLP)
Dimethyl ether	100%	115-10-6	204-065-8	01-2119472128-37-0000	F+; R12	Flam. Gas; H220 Press. Gas; H280

## 4. First aid measures



The first aid advice given for skin contact, eye contact and ingestion is applicable following exposures to the liquid or spray. Also see section 11.

**Inhalation**

Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external cardiac massage. Obtain immediate medical attention.

**Skin contact**

Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in the case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If irritation or blistering occur, obtain medical attention.

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## 4. First aid measures continued

<b>Eye contact</b>	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least 15 minutes. Obtain immediate medical attention.
<b>Ingestion</b>	Unlikely route of exposure. Do not induce vomiting. Provided the patient is conscious, wash out mouth with water and give 200-300ml (half a pint) of water to drink. Obtain immediate medical attention.
<b>Most important symptoms and effects both acute and delayed.</b>	Skin contact may produce the following symptoms : Frostbite Inhalation may produce the following symptoms : Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity.
<b>Indication of any immediate medical attention and special treatment needed</b>	Do not give adrenaline or similar drugs.

## 5. Fire-fighting measures

<b>Specific hazards</b>	Exposure to fire may cause containers to rupture/explode.
<b>Hazardous combustion products</b>	Incomplete combustion may form carbon monoxide.
<b>Extinguishing media</b> <b>-Suitable extinguishing media</b> <b>Specific methods</b>	All known extinguishants can be used. If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
<b>Special protective equipment for fire fighters</b>	In confined space use self-contained breathing apparatus.

## 6. Accidental release measures

<b>Personal precautions</b>	Evacuate personnel to safe areas. Ventilate area.. Refer to protective measures listed in sections 7 and 8.
<b>Environmental precautions</b>	Should not be released into the environment.
<b>Clean up measures</b>	Evaporates.

## 7. Handling and storage

<b>Precautions for safe handling</b> <b>Advice for safe handling</b>	<b>Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing.</b> Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8. See Annex – Section 2.2
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### 7. Handling and storage continued

#### Advice on protection against fire and explosion

Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. The products should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. No sparking tools should be used. Take measures to prevent the build of electrostatic charge. Keep away from heat and sources of ignition. Keep away from open flames., hot surfaces and sources of ignition. When using do not smoke.

Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing.

#### Conditions for safe storage, including any incompatibilities Requirements for storage areas and Containers

Keep containers tightly closed in a cool, well ventilated place. Store in original container.

#### Specific end uses

No data available.

### 8. Exposure controls / personal protection

#### Control parameters

##### Components with workplace control parameters

Components	CAS-No.	Type form of exposure	Control parameters	Update	Basis
Dimethyl ether	115-10-6	TWA	766mg/m <sup>3</sup> , 400ppm	2007	EH40 WEL
		STEL	985mg/m <sup>3</sup> , 500ppm	2007	
		TWA	1920mg/m <sup>3</sup> , 1000ppm	02 2006	

#### Derived No Effect Level

- Dimethyl ether

Type of Application (Use): Workers exposure routes: Inhalation health effect: Chronic effects, systematic toxicity value: 1894mg/m<sup>3</sup>

Type of Application (Use): Consumers exposure routes: Inhalation health effect: Chronic effects, systematic toxicity value: 471mg/m<sup>3</sup>

#### Predicted No Effect Concentration

- Dimethyl ether

Value: 0,155 mg/l  
Compartment: Fresh water

Value: 0,016 mg/l  
Compartment: Marine water

Value: 1,549 mg/l  
Compartment: Water  
Remarks: Intermittent use/release

Value: 160 mg/l  
Compartment: Water  
Remarks: sewage treatment plants

Value: 0,681 mg/l  
Compartment: Fresh water sediment

Value: 0,069 mg/l  
Compartment: Marine sediment

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### 8. Exposure controls / personal protection continued

Value: 0,045 mg/l

Compartment: Soil

#### Personal protection

Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases. In cases of insufficient ventilation, where exposure to high concentrations of vapour is possible, suitable respiratory protective equipment with positive air supply should be used. Do not smoke while handling product.



Safety glasses. Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.



Heat insulating gloves

### 9. Physical and chemical properties

<b>Form</b>	Liquefied gas
<b>Physical state at 20°C</b>	Gas
<b>Colour</b>	Colourless
<b>Odour</b>	Slight ether-like.
<b>Molecular weight [g/mol]</b>	46.07
<b>Solubility in water [g/l]</b>	45.6 at 25°C at 1013 hPa
<b>Boiling point/boiling range (°C)</b>	-24.8 at 1013 hPa
<b>Melting point/range (°C)</b>	-141.5 at 1013 hPa
<b>Relative density</b>	1.88 at 25°C
<b>Vapour pressure (25°C)</b>	5132,9 hPa
<b>Flammability range [vol% in air]</b>	3.3 to 26.2
<b>Auto ignition temperature [°C]</b>	226 at 1013 hPa
<b>Explosive properties</b>	Not explosive
<b>Partition coefficient: n-octanol/water</b>	POW 0.07 at 25°C
<b>Other data</b>	No data available.

### 10. Stability and reactivity

<b>Reactivity</b>	Extremely flammable gas.
<b>Chemical Stability</b>	The product is chemically stable
<b>Possibility of hazardous reactions</b>	Vapours may form explosive mixture with air.
<b>Conditions to avoid</b>	Temperatures > 52°C
<b>Incompatible materials</b>	Oxygen, oxidising agents, acid anhydrides, strong acids, Carbon monoxide, acetic anhydride, powdered metals.
<b>Hazardous decomposition products</b>	Hazardous thermal decomposition products may include: Formaldehyde, carbon dioxide, Carbon monoxide, Methanol.

## 11. Toxicological information

### Information on toxicological effects

#### Acute oral toxicity

- Dimethyl ether Not applicable

#### Acute inhalation toxicity

- Dimethyl ether LC50/rat: 164000 ppm  
Respiratory effects, anaesthetic effects, central nervous system depression, narcosis, cardiac irregularities, coma.  
  
/ dog  
Cardiac sensitization.

#### Acute dermal toxicity

- Dimethyl ether Not applicable

#### Skin irritation

- Dimethyl ether Not tested on animals.  
Classification: Not classified as irritant.  
Result: No skin irritation.  
Not expected to cause skin irritation based on expert review of the properties of the substance.

#### Eye irritation

- Dimethyl ether Not tested on animals.  
Classification: Not classified as irritant.  
Result: No eye irritation.  
Not expected to cause eye irritation based on expert review of the properties of the substance.

#### Sensitisation

- Dimethyl ether Not tested on animals.  
Classification: Not classified as skin sensitizer.  
Not expected to cause sensitization based on expert review of the properties of the substance.
- Dimethyl ether There are no reports of human skin sensitization.

#### **There are no reports of human respiratory sensitization.**

#### Repeated dose toxicity

- Dimethyl ether Inhalation rat: No toxicologically significant effects were found.

#### Mutagenicity assessment

- Dimethyl ether Animal testing did not show mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

#### Carcinogenicity assessment

- Dimethyl ether Animal testing did not show any carcinogenic effects.

#### Toxicity to reproduction assessment

- Dimethyl ether No toxicity to reproduction.

#### Further information

May cause cardiac arrhythmia. Rapid evaporation of the liquid may cause frostbite.

## 12. Ecological information

### Toxicity

#### Toxicity to fish

- Dimethyl ether LC50/96 h/Poecilia reticulata (guppy): >4000 mg/l

#### Toxicity to aquatic invertebrates

- Dimethyl ether EC50/48 h/Daphnia: >4000 mg/l  
LC50/48 h/Daphnia: 755,549 mg/l

#### Chronic toxicity to fish

- Dimethyl ether Due to its physical properties, there is no potential for adverse effects.

### Persistence and degradability

#### Biodegradability

Method: Closed bottle test. According to the results of tests of biodegradability this product is not readily biodegradable.

#### Physio-chemical removability

The product can be degraded by abiotic (e.g. chemical or photolytic) processes.

### Bio-accumulative potential

#### Bio-accumulation

No data available.

### Mobility in soil

#### Mobility in soil

Koc: 7,759

### Results of PBT and vPvB assessment

#### Results of PBT and vPvB Assessment

This substance is not considered to be persistent, bio-accumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bio-accumulating (vPvB).

### Other adverse effects

#### Ozone depletion potential

0

#### Global warming potential (GWP)

1

## 13. Disposal information

### Waste treatment methods

#### Product

Can be used after re-conditioning. In accordance with local and national regulations. Must be incinerated in suitable incineration plant holding a permit delivered by the competent authorities.  
See Annex – Section 2.1

#### Contaminated packaging

Empty pressure vessels should be returned to the supplier.

## 14. Transport information

UN No. 1033  
Labelling ADR, IMDG, IATA



2.1 : flammable gas

### Land transport

ADR/RID  
H.I.nr 23  
UN No. 1033  
UN Proper shipping name Dimethyl ether  
Labelling No. 2.1  
Transport hazard class(es) 2  
DR/RID Classification code 2 F  
Tunnel instructions (B/D)

### Sea transport

IMO-IMDG code  
Proper shipping name Dimethyl ether  
Class 2.1  
UN No. 1033  
Labelling No. 2.1

### Air transport

IATA\_C  
-Proper shipping name Dimethyl ether  
Class 2.1  
UN No. 1033  
Labelling No. 2.1

Further information ICAO/IATA cargo aircraft only.

## 15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture No data available.

Chemical safety Assessment A chemical Safety Assessment has been carried out for this substance.

## 16. Other information

Text of R-phrases mentioned in Section 3 R12 Extremely flammable

Full text of H-Statements referred to Under Section 3  
H220 - Extremely flammable gas.  
H280 - Contains gas under pressure; may explode if heated.



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## 16. Other information continued

### Further information

For further information contact Harp International Limited.

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### Annex:

#### 1 Exposure Scenario (2)

Formulation and repacking

SU 3, 10

PC1, 3, 4, 8, 9a, 14, 15, 21, 23, 24, 25, 26, 27, 29, 31, 32, 34, 35, 38, 39

PROC 1, 2, 3, 4, 5, 8b, 9

ERC 2

Formulation/blending in batch processes, transfers and packaging will describe the group of contributing scenarios listed below:

Scenario name	Process Category (PROC)	Type of setting	Short name
Use in closed process	PROC 1	Industrial	CS 1
Use in closed continuous process w/occasional controlled exposure	PROC 2	Industrial	CS 2
Use in closed batch process	PROC 3	Industrial	CS 3
Use in batch and other process where opportunity for exposure	PROC 4	Industrial	CS 4
Mixing and blending	PROC 5	Industrial	CS 5
Transfer to small containers	PROC 9	Industrial	CS 6
Transfer at dedicated facilities	PROC 8b	Industrial	CS 7

#### 2.1 Contributing scenario (1) controlling environmental exposure for formulation/blending in batch processes and packaging

##### Product characteristics

Physical state: gas/liquefied gas

Concentration: max, 100%

##### Amounts used

Max. 6000 t/year or 20 t/day [largest site tonnage]

##### Frequency and duration of use

300 days/year

##### Environment factors not influenced by risk management

Dilution factor river: 10

Dilution factor marine: 100

##### Other given operational conditions affecting environmental exposure

None

##### Technical conditions and measures at process level (source) to prevent release

Containment in process

##### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

None

##### Organisational measures to prevent/limit release from site

None

##### Conditions and measures related to municipal sewage treatment

Effluent rate of municipal STP: 2000 m<sup>3</sup>/days

River flow rate: 18000 m<sup>3</sup>/days

##### Conditions and measures related to external treatment of waste disposal

No waste generated as substance is a gas and will evaporate to air.

##### Conditions and measures related to external recovery of waste

None.

#### 2.2 Contributing scenario (2) controlling worker exposure for Formulation/blending in batch processes, transfers and packaging

##### Product characteristic

Physical state: gas/liquefied gas

Concentration: max. 100%

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### Amounts used

Not relevant

### Frequency & duration of exposure

Exposure frequency: daily for all PROCs

Scenario name	Duration of activity [hours/day]
CS1	>4 hours
CS2	>4 hours
CS3	>4 hours
CS4	>4 hours
CS5	>4 hours
CS6	>4 hours
CS7	>4 hours

### Human factors not influenced by risk management

None

### Other given operational conditions affecting workers exposure

Scenario name	Use of ventilation
CS1	Indoors without LEV
CS2	Indoors without LEV
CS3	Indoors without LEV
CS4	Indoors without LEV
CS5	Indoors without LEV
CS6	Indoors without LEV
CS7	Indoors without LEV

### Technical conditions and measures at process level (source) to prevent release

Handling in industrial settings.  
Containment according to definition of PROCs for liquefied gas.  
See SDS section 7.

### Technical conditions and measures to control dispersion from source towards the worker

None

### Organisational measures to prevent/limit release, dispersion and exposure

See SDS.

### Conditions and measures related to personal protection, hygiene and health evaluation

See SDS section 8.

### 3. Exposure estimation and reference to its source

Scenario name	Inhalative Exposure Estimate (mg/m <sup>3</sup> )
CS1	0.0192
CS2	96.0
CS3	192
CS4	192
CS5	480
CS6	384
CS7	288

Comment: Tables below are reporting worst case values for PROC 5 – CS 5:

(Semi) Quantitative risk characterisation for workers

	Leading toxic end point/critical effect	Risk characterisation ratio
Long term- systematic effects - inhalation	Anaesthetic	0.3

(Semi) Quantitative risk characterisation for humans exposed via environment

Route	Leading toxic end point/critical effect	Risk characterisation ratio (RCR)
Long term- systematic effects - inhalation	Anaesthetic	0.00002

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### Risk characterisation for the aquatic compartment

Compartments	RCR
Freshwater	0.00001
Marine water	0.00006
Sediment	0.00001
Marine sediment	0.00006

### Risk characterisation for the terrestrial compartment

Compartments	RCR
Agricultural soil	0.07
Grassland	0.07

### Microbiological activity in sewage treatment systems

Compartments	RCR	Discussion
STRP (mg/l)	0.003	No release to STP

#### Assessment method:

Worker inhalation: ECETOC TRAM worker (May 2010 release)

Man via Environment: ECETOC TRAM Environment (May 2010 release)

Consumer: ECETOC TRAM Consumer (May 2010 release)

Environment: ECETOC TRAM Environment (May 2010 release)

#### Release factors:

Air: 0.2%, max release rate of 40 kg/day per site

Wastewater: no release to wastewater

Soil: no processes/process steps leading to direct release to soil

### 4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

#### Worker exposure

Input parameters resulting in highest exposure estimates (worst-case) were used to evaluate worker exposures (see section 3). If the downstream user reduces exposure duration each activity/process to less than 8 hours, it may be necessary to consider summing exposure estimates if the same worker may be engaged in multiple tasks during the day.

For DNELs, see SDS section 8.

#### Environmental exposure

Downstream users should check whether they are still within the boundaries of the ES if:

- Release factors exceed those listed (see Section 3),
- Number of operating days is less than the frequency and duration of use (see Section 2.1), or
- Actual tonnage (one location) exceeds amount used (see Section 2.1)

#### ECETOC/TRAM basic input parameters

Molecular weight: 46.07 g/mol

Vapour pressure, water solubility, octanol-water partition coefficient [Kow] (see SDS Section 9), organic-carbon adsorption coefficient [Koc], bio-degradability (see SDS Section 12)

For PNECs, see SDS Section 8.

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### 1 Exposure Scenario (6)

Industrial/professional use of propellants

SU 3, 19, 22

PC1, 3, 4, 8, 9a, 14, 15, 21, 23, 24, 25, 26, 27, 29, 31, 32, 34, 35, 39

PROC 7, 11, 15

PC1, 3, 4, 8, 9a, 14, 15, 21, 23, 24, 25, 26, 27, 29, 31, 32, 34, 35, 39

ERC 8a, 8d

Spraying of propellant and laboratory use as a chemical will describe the group contributing scenarios listed below:

Scenario name	Process Category (PROC)	Type of setting	Short name
Industrial spraying	PROC 7	Industrial	CS 1
Industrial spraying	PROC 7	Industrial	CS 2
Professional spraying	PROC 11	Professional	CS 3
Professional spraying	PROC 11	Professional	CS 4
Use of laboratory in small scale laboratory	PROC 15	Professional	CS 5

### 2.1 Contributing scenario (1) controlling environmental exposure for spraying of propellant and laboratory use as a chemical

#### Product characteristics

Physical state: gas/liquefied gas

Concentration: >25% (ECETOC TRAM does not modify exposure estimates for substances in mixtures if >25%)

#### Amounts used

Max. 15000 t/year

Fraction to region 0.1 (default for wide dispersive use)

Fraction used at main local source: 0.002 (default for wide dispersive use)

#### Frequency and duration of use

Continuous release, 365 days/year (default for wide dispersive use)

#### Environment factors not influenced by risk management

Dilution factor river: 10

Dilution factor marine: 100

#### Other given operational conditions affecting environmental exposure

None

#### Technical conditions and measures at process level (source) to prevent release

None

#### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

None

#### Organisational measures to prevent/limit release from site

None

#### Conditions and measures related to municipal sewage treatment

Effluent rate of municipal STP: 2000 m<sup>3</sup>/days

River flow rate: 18000 m<sup>3</sup>/days

#### Conditions and measures related to external treatment of waste disposal

No waste generated as substance is a gas and will evaporate to air.

#### Conditions and measures related to external recovery of waste

None.

### 2.2 Contributing scenario (2) controlling worker exposure for spraying of propellant and laboratory use as a chemical

#### Product characteristic

Physical state: gas/liquefied gas

Concentration: >25% (ECETOC TRAM does not modify exposure estimates for substances in mixtures if >25%)

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### Amounts used

Not applicable

### Frequency & duration of exposure

Exposure frequency: daily for all PROCs

Scenario name	Duration of activity [hours/day]
CS1	>4 hours
CS2	>4 hours
CS3	>4 hours
CS4	1-4 hours
CS5	>4 hours

### Human factors not influenced by risk management

None

### Other given operational conditions affecting workers exposure

Scenario name	Use of ventilation
CS1	Outdoors
CS2	Indoors without LEV
CS3	Outdoors
CS4	Indoors without LEV
CS5	Indoors without LEV

### Technical conditions and measures at process level (source) to prevent release

Handling in industrial settings.  
Containment according to definition of PROCs for liquefied gas.  
See SDS section 7.

### Technical conditions and measures to control dispersion from source towards the worker

None

### Organisational measures to prevent/limit release, dispersion and exposure

See SDS.

### Conditions and measures related to personal protection, hygiene and health evaluation

See SDS section 8.

### 3. Exposure estimation and reference to its source

Scenario name	Inhalative Exposure Estimate (mg/m <sup>3</sup> )
CS1	672
CS2	960
CS3	1340
CS4	1150
CS5	96

Comment: Tables below are reporting worst case values for PROC 5 – CS 3:

(Semi) Quantitative risk characterisation for workers

	Leading toxic end point/critical effect	Risk characterisation ratio
Long term- systematic effects - inhalation	Anaesthetic	0.7

(Semi) Quantitative risk characterisation for humans exposed via environment

Route	Leading toxic end point/critical effect	Risk characterisation ratio (RCR)
Long term- systematic effects - inhalation	Anaesthetic	0.0000005

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### Risk characterisation for the aquatic compartment

Compartments	RCR
Freshwater	0.00001
Marine water	0.00006
Sediment	0.00001
Marine sediment	0.00006

### Risk characterisation for the terrestrial compartment

Compartments	RCR
Agricultural soil	0.03
Grassland	0.004

#### Assessment method:

Worker inhalation: ECETOC TRAM worker (May 2010 release)

Man via Environment: ECETOC TRAM Environment (May 2010 release)

Consumer: ECETOC TRAM Consumer (May 2010 release)

Environment: ECETOC TRAM Environment (May 2010 release)

#### Release factors:

Air: 100%, max release rate of 4110 kg/day (regional release)

Wastewater: no release to STP

Soil: no direct release to soil

### 4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

#### Worker exposure

Input parameters resulting in highest exposure estimates (worst-case) were used for all activities/processes except for professional spraying (PROC 11), which is limited to 4 hours or less where the activity occurs indoors without LEV. If operating conditions differ, exposure estimates can be scaled using ECETOC TRAM exposure modifiers as follows:

$$RCR_s = RCR_o \times \sum_{i=1}^n CF_{s,i} \div CF_o$$

$RCR_o$  = original exposure prediction

$RCR_s$  = scaled exposure prediction

$CF_{s,i}$  = original correction factor

$CF_{o,i}$  = correction factor for the *i*th determinant scaling

Correction factor for professional spraying (PROC 11) indoors without LEV = 1 ( $CF_o$ )

Correction factor for professional spraying indoors with LEV = 0.2 ( $CF_s$ )

#### Other notes

If the downstream user reduces the exposure duration for each activity/process to less than 8 hours, it may be necessary to consider summing exposure estimates if the same worker may be engaged in multiple tasks during the day.

For DNELs, see SDS section 8.

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### Environmental exposure

If conditions differ significantly from those listed in Section 2.1, downstream user (DU) should check whether they are still within the boundaries of the ES. For wide-dispersive releases, DU should check that the RCR from all wide-dispersive releases are below one. This is shown in column ET of the “datasheets” worksheet in ECETOC TRAM.

Basic input parameters required for the environmental assessment using ECETOC TRAM are:

ECETOC/TRAM basic input parameters

Molecular weight: 46.07 g/mol

Vapour pressure, water solubility, octanol-water partition coefficient [Kow] (see SDS Section 9), organic-carbon adsorption coefficient [Koc], bio-degradability (see SDS Section 12)

For PNECs, see SDS Section 8.



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### 1 Exposure Scenario (7)

Consumer use of propellants

SU 21

PC1, 3, 4, 8, 9a, 24, 39

ERC 8a, 8d (ERC 8a covered by ERC 8d)

Scenario name	Product Category (PC)	Type of setting	Short name
Spraying of propellants indoors and outdoors	PROC1, 3, 4, 8 9a, 24, 39	Consumer	CS 1

### 2.1 Contributing scenario (1) controlling environmental exposure for spraying of propellant indoors and outdoors

#### Product characteristics

Concentration: typically <50% substance in preparation

Physical state: gas/liquefied gas

#### Amounts used

3000 t/year

Fraction to region 0.1 (default for wide dispersive use)

Fraction used at main local source: 0.002 (ESVOC spERC 8.23b.v1 [ESVOC 22]))

#### Frequency and duration of use

Continuous release, 365 days/year (default for wide dispersive use)

#### Environment factors not influenced by risk management

Dilution factor river: 10

Dilution factor marine: 100

#### Other given operational conditions affecting environmental exposure

None

#### Conditions and measures related to municipal sewage treatment plant

Effluent rate of municipal STP: 2000m<sup>3</sup>/day

River flow rate: 18000m<sup>3</sup>/day

#### Conditions and measures related to external treatment of waste disposal

None

#### Conditions and measures related to external recovery of waste

None.

### 2.2 Contributing scenario (2) controlling worker exposure for spraying of propellants indoors and outdoors

#### Product characteristic

Concentration: typically <50% substance in preparation

Physical state: gas/liquefied gas

#### Amounts used

Up to 10g per application

#### Frequency & duration of exposure

Frequency: 4 times/day

Duration [for contact]: 15 minutes

#### Human factors not influenced by risk management

None

#### Other given operational conditions affecting workers exposure

This product is used indoors and outdoors. Only indoors is considered since it leads to worst case potential exposure.

Indoor air volume: min. >2.5m<sup>3</sup>, 1.5/hr air exchange rate

#### Conditions and measures related to information and behavioural advice to consumers

Label advices on safe use.

#### Conditions and measures related to personal protection and hygiene

Label advices on safe use.

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### 3. Exposure estimation and reference to its source

**Scenario name** Inhalative Exposure Estimate (mg/m<sup>3</sup>)  
CS1 57.1

Comment: Tables below are reporting worst case values for PC 9a:

(Semi) Quantitative risk characterisation for workers

	Leading toxic end point/critical effect	Risk characterisation ratio
Long term- systematic effects – inhalation	Anaesthetic	0.4

(Semi) Quantitative risk characterisation for humans exposed via environment

Route	Leading toxic end point/critical effect	Risk characterisation ratio (RCR)
Long term- systematic effects – inhalation	Anaesthetic	0.0000005

Risk characterisation for the aquatic compartment

Compartments	RCR
Freshwater	0.00001
Marine water	0.00006
Sediment	0.00001
Marine sediment	0.00006

Risk characterisation for the terrestrial compartment

Compartments	RCR
Agricultural soil	0.00005
Grassland	0.00005

Assessment method:

Consumer: ECETOC TRAM Consumer (May 2010 release), ConsExpo 4.1, and AISE REACT

Man via Environment: ECETOC TRAM Environment (May 2010 release)

Environment: ECETOC TRAM Environment (May 2010 release)

Release factors:

Air: spERC ESVOG 22 (refinement of ERC 8a): release to air is 100%, max release rate of 8220 kg/day (regional release)

Wastewater: No release to wastewater as 100% goes to air

Soil: no direct release to soil as 100% goes to air

### 4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

If conditions differ significantly from those listed in Section 2, downstream user (DU) should check whether they are still within the boundaries of the ES. This evaluation may be based on expert judgement or on the risk assessment tools that are recommended by ECHA.