

**PRF Isooctane**

Version 2.0

Revision Date 2011-03-03

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**Product information**

Trade name : PRF Isooctane
Material : 1020572, 1020570, 1020569, 1031133, 1020567, 1020571

EC-No.Registration number

Chemical Name	CAS-No. Index-No.	Registration number
2,2,4-Trimethylpentane (Isooctane)	540-84-1 601-009-00-8	01-2119457965-22-0002

Relevant Identified Uses Supported : Formulation
Use as a fuel - industrial
Use as a fuel – professional

Company : Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Local : Chevron Phillips Chemicals International N.V.
Brusselsesteenweg 355
B-3090 Overijse
Belgium

MSDS Requests: (800) 852-5530
Technical Information: (832) 813-4862
Responsible Party: Product Safety Group
Email:msds@cpchem.com

Emergency telephone:**Health:**

866.442.9628 (North America)
1.832.813.4984 (International)

Transport:

North America: CHEMTREC 800.424.9300 or 703.527.3887
Asia: +800 CHEMCALL (+800 2436 2255) China: 0532.8388.9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Chemcare Asia: Tel: +65 6848 9048 - Mob: +65 8382 9188 - Fax: +65 6848
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group
E-mail address : MSDS@CPChem.com
Website : www.CPChem.com

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2. HAZARDS IDENTIFICATION**Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Flammable liquids, Category 2	H225: Highly flammable liquid and vapor.
Skin irritation, Category 2	H315: Causes skin irritation.
Specific target organ systemic toxicity - single exposure, Category 3	H336: May cause drowsiness or dizziness.
Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Acute aquatic toxicity, Category 1	H400: Very toxic to aquatic life.
Chronic aquatic toxicity, Category 1	H410: Very toxic to aquatic life with long lasting effects.

Classification (67/548/EEC, 1999/45/EC)

Highly flammable	R11: Highly flammable.
Harmful	R65: Harmful: may cause lung damage if swallowed.
Irritant	R38: Irritating to skin.
Dangerous for the environment	R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R67: Vapors may cause drowsiness and dizziness.

Label elements**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : H225 Highly flammable liquid and vapor.
 H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H336 May cause drowsiness or dizziness.
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
 P233 Keep container tightly closed.
 P240 Ground/bond container and receiving equipment.
 P243 Take precautionary measures against static discharge.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
 P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing.

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P304 + P340

Rinse skin with water/ shower.
 IF INHALED: Remove victim to fresh air
 and keep at rest in a position comfortable
 for breathing.

P331

Do NOT induce vomiting.

Storage:

P403 + P235

Store in a well-ventilated place. Keep cool.

Disposal:

P501

Dispose of contents/ container to an
 approved waste disposal plant.

Hazardous ingredients which must be listed on the label:

- 540-84-1 2,2,4-Trimethylpentane (Isooctane)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : 2,2,4-Trimethylpentane
 ASTM Isooctane Knock Test Reference Fuel
 Isooctane (ASTM Grade)
 Isooctane
 Primary Reference Fuel

Molecular formula : C₈H₁₈**Mixtures****Hazardous ingredients**

Chemical Name	CAS-No. EINECS-No.	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1	F; R11 Xn; R65 Xi; R38 R67 N; R50-R53	Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Flam. Liq. 2; H225 Skin Irrit. 2; H315 STOT SE 3; H336	99 - 100

EC-No.Registration number

Chemical Name	CAS-No. EINECS-No.	Registration number
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1	01-2119457965-22-0002

For the full text of the R-phrases mentioned in this Section, see Section 16.

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

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- General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may only appear several hours later. Do not leave the victim unattended.
- If inhaled : If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.
- In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
- In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

5. FIRE-FIGHTING MEASURES

- Flash point : -12,22 °C (10,00 °F) estimated
- Autoignition temperature : 411 °C (772 °F)
- Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemical.
- Unsuitable extinguishing media : High volume water jet.
- Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Special protective equipment for fire-fighters : Wear self contained breathing apparatus for fire fighting if necessary.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
- Fire and explosion protection : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
- Hazardous decomposition products : Hydrocarbons. Carbon oxides.

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6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
- Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

7. HANDLING AND STORAGE**Handling**

- Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

- Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters****Chevron Phillips Chemical Company LP**

Ingredients	Basis	Value	Control parameters	Note
2,2,4-Trimethylpentane (Isooctane)	Manufacturer	TWA	300 ppm,	

FI

Aineosat	Peruste	Arvo	Valvontaa koskevat muuttujat	Nota
2,2,4-Trimethylpentane (Isooctane)	FI OEL	HTP-arvot 8h	300 ppm, 1.400 mg/m3	
	FI OEL	HTP-arvot 15 min	380 ppm, 1.800 mg/m3	

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DNEL : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Chronic effects, Systemic effects
Value: 773 mg/kg

DNEL : End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Chronic effects, Systemic effects
Value: 2035 mg/m³

Personal protective equipment

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection : Impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

|| For additional details, see the Exposure Scenario in the Annex portion

9. PHYSICAL AND CHEMICAL PROPERTIES**Information on basic physical and chemical properties****Appearance**

Form : Liquid
Physical state : Liquid
Color : Colorless
Odor : Mild

Safety data

Flash point : -12,22 °C (10,00 °F)
estimated
Lower explosion limit : 1 %(V)
Upper explosion limit : 7 %(V)
Oxidizing properties : No
Autoignition temperature : 411 °C (772 °F)
Molecular formula : C₈H₁₈
Molecular Weight : 114,26 g/mol
pH : Not applicable

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Pour point	: No data available
Boiling point/boiling range	: 99 °C (210 °F)
Vapor pressure	: 1,70 PSI at 37,8 °C (100,0 °F)
Water solubility	: Negligible
Partition coefficient: n-octanol/water	: No data available
Viscosity, kinematic	: 0,503 cSt at 20 °C (68 °F)
Relative vapor density	: 1 (Air = 1.0)
Evaporation rate	: 1
Percent volatile	: > 99 %

10. STABILITY AND REACTIVITY**Possibility of hazardous reactions**

Conditions to avoid	: Heat, sparks, fire, and oxidizing agents.
Materials to avoid	: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Other data	: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION**Acute oral toxicity**

2,2,4-Trimethylpentane (Isooctane)	: LD50: > 5.000 mg/kg Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation
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Acute inhalation toxicity

2,2,4-Trimethylpentane (Isooctane)	: LC50: > 33,52 mg/l Exposure time: 4 HR Species: rat Sex: male and female Method: OECD Test Guideline 403
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Acute dermal toxicity

2,2,4-Trimethylpentane	: LD50: > 2.000 mg/kg
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(Isooctane)

Species: rabbit
Sex: male and female
Method: OECD Test Guideline 402

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Skin irritation : Irritating to skin.

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Eye irritation : No eye irritation

Sensitization

2,2,4-Trimethylpentane : Does not cause skin sensitization.
(Isooctane)

Repeated dose toxicity

2,2,4-Trimethylpentane : Species: rat, Male and female
(Isooctane) Sex: Male and female
Application Route: Inhalation
Dose: 0, 668, 2220, 6646 ppm
Exposure time: 13 weeks
Number of exposures: 6 hr/day 5 d/wk
NOEL: 8,117 mg/l 2220 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

Reproductive toxicity

2,2,4-Trimethylpentane : Species: rat
(Isooctane) Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6 h/d 5 d/wk
Method: OECD Test Guideline 416
NOAEL Parent: 3000 ppm
NOAEL F1: 3000 ppm
NOAEL F2: 3000 ppm

Teratogenicity

2,2,4-Trimethylpentane : Species: rat
(Isooctane) Application Route: Inhalation
Dose: 0, 400, 1200 ppm
Number of exposures: 6h/d
Test period: GD6-15
NOAEL Teratogenicity: 1200 ppm
NOAEL Maternal: 1200 ppm

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Species: rat
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Number of exposures: 6h/d
 Test period: GD6-15
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 9000 ppm
 NOAEL Maternal: 3000 ppm

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Aspiration toxicity

: May be fatal if swallowed and enters airways.
 Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

CMR effects

2,2,4-Trimethylpentane
 (Isooctane)

: Carcinogenicity: Not available
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

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Further information

: Solvents may degrease the skin.

12. ECOLOGICAL INFORMATION**Toxicity to fish**

2,2,4-Trimethylpentane
 (Isooctane)

: LC50: 0,11 mg/l
 Exposure time: 96 HR
 Species: Oncorhynchus mykiss (rainbow trout)
 semi-static test Method: OECD Test Guideline 203
 Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates.

2,2,4-Trimethylpentane
 (Isooctane)

: EC50: 0,4 mg/l
 Exposure time: 48 HR
 Species: Daphnia magna (Water flea)
 static test Information given is based on data obtained from similar substances.

Toxicity to algae

2,2,4-Trimethylpentane
 (Isooctane)

: EL50: 2,943 mg/l
 Exposure time: 72 HR
 Method: QSAR modeled data

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Toxicity to daphnia and other aquatic invertebrates. (Chronic toxicity)

2,2,4-Trimethylpentane (Isooctane) : NOEC: 0,17 mg/l
Exposure time: 21 D
Species: Daphnia magna (Water flea)

Bioaccumulation

2,2,4-Trimethylpentane (Isooctane) : Bioconcentration factor (BCF): 231
Method: Estimated based on individual component values.

Biodegradability

2,2,4-Trimethylpentane (Isooctane) : Result: Not readily biodegradable.
Method: OECD Test Guideline 301
Expected to be inherently biodegradable.
Information given is based on data obtained from similar substances.

Further information on ecology**Results of PBT assessment**

2,2,4-Trimethylpentane (Isooctane) : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

The information in this MSDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

|| For additional details, see the Exposure Scenario in the Annex portion

14. TRANSPORT INFORMATION

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

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Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the MSDS and the bill of lading.

USDOT

UN1262, OCTANES, 3, II, RQ (2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IMO / IMDG

UN1262, OCTANES, 3, II, MP (2,2,4-TRIMETHYLPENTANE (ISOOCTANE)), RQ (2,2,4-TRIMETHYLPENTANE (ISOOCTANE)), (-12,22 °C)

IATA

UN1262, OCTANES, 3, II

ADR

UN1262, OCTANES, 3, II

RID

UN1262, OCTANES, 3, II

15. REGULATORY INFORMATION**National legislation****Chemical Safety Assessment**

Ingredients : 2,2,4-trimethylpentane A Chemical Safety Assessment 208-759-1 has been carried out for this substance.

Major Accident Hazard Legislation : 96/82/EC Update: 2003
Dangerous for the environment
9a
Quantity 1: 100 t
Quantity 2: 200 t

: 96/82/EC Update: 2003
Highly flammable
7b
Quantity 1: 5.000 t
Quantity 2: 50.000 t

Notification status

Europe REACH : On the inventory, or in compliance with the inventory
United States of America US.TSCA : On the inventory, or in compliance with the inventory
Canada DSL : On the inventory, or in compliance with the inventory
Australia AICS : On the inventory, or in compliance with the inventory
New Zealand NZIoC : On the inventory, or in compliance with the inventory
Japan ENCS : On the inventory, or in compliance with the inventory
Korea KECI : On the inventory, or in compliance with the inventory
Philippines PICCS : On the inventory, or in compliance with the inventory
China IECSC : On the inventory, or in compliance with the inventory

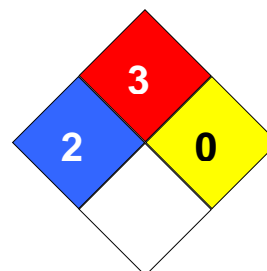
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16. OTHER INFORMATION

NFPA Classification : Health Hazard: 2
Fire Hazard: 3
Reactivity Hazard: 0

**Further information**

Legacy MSDS Number : 26040

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this MSDS pertains only to the product as shipped.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LOAEL	Lowest Observed Adverse Effect Level
AICS	Australia, Inventory of Chemical Substances	NFPA	National Fire Protection Agency
DSL	Canada, Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
NDSL	Canada, Non-Domestic Substances List	NTP	National Toxicology Program
CNS	Central Nervous System	NZIoC	New Zealand Inventory of Chemicals
CAS	Chemical Abstract Service	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration	NOEC	No Observed Effect Concentration
EC50	Effective Concentration 50%	OSHA	Occupational Safety & Health Administration
EINECS	European Inventory of Existing Chemical Substances	PEL	Permissible Exposure Limit
MAK	Germany Maximum Concentration Values	PICCS	Philippines Inventory of Commercial Chemical Substances
GHS	Globally Harmonized System	PRNT	Presumed Not Toxic
>=	Greater Than or Equal To	RCRA	Resource Conservation Recovery Act
IC50	Inhibition Concentration 50%	STEL	Short-term Exposure Limit
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act.
IECSC	Inventory of Existing Chemical Substances in China	TLV	Threshold Limit Value
ENCS	Japan, Inventory of Existing and New Chemical Substances	TWA	Time Weighted Average
KECI	Korea, Existing Chemical Inventory	TSCA	Toxic Substance Control Act
<=	Less Than or Equal To	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
LC50	Lethal Concentration 50%	WHMIS	Workplace Hazardous Materials

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			Information System
LD50	Lethal Dose 50%		

Full text of R-phrases referred to under sections 2 and 3

R11	Highly flammable.
R38	Irritating to skin.
R50	Very toxic to aquatic organisms.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

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Annex**1. Short title of Exposure Scenario: Formulation**

Main User Groups	:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting; PROC15: Use as laboratory reagent
Environmental release category	:	ERC2: Formulation of preparations
Further information	:	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

ERC2: Formulation of**preparations****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)

(Msafe) : 900 tonnes/day

Environment factors not influenced by risk management

Flow rate : 18.000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Continuous use/release
Number of emission days per year : 300
Emission or Release Factor: Air : 2,5 %

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Emission or Release Factor: Water : 0,002 %

Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide the required removal efficiency of (%) (Effectiveness: 0 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): (Effectiveness: 61,8 %)

Remarks : Risk from environmental exposure is driven by freshwater sediment.

Water : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): (Effectiveness: 0 %)

Remarks : If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

Remarks : Common practices vary across sites thus conservative process release estimates used.

Conditions and measures related to municipal sewage treatment plantFlow rate of sewage treatment plant effluent : 2.000 m³/d

Effectiveness (of a measure) : 96,3 %

Percentage removed from waste water : 96,3 %

Conditions and measures related to external treatment of waste for disposal

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)

Physical Form (at time of use) : Liquid substance

Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

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Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system., Transfer via enclosed lines.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Avoid dip sampling., Formulate in enclosed or ventilated mixing vessels., Provide enhanced general ventilation by mechanical means.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC15: Use in batch and other process (synthesis) where opportunity for exposure arises, Use as laboratory reagent**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

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differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

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Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Use drum pumps or carefully pour from container., Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Use drum pumps or carefully pour from container., Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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

Wear suitable gloves tested to EN374.

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2.2 Contributing scenario controlling worker exposure for: , PROC14: Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure estimation and reference to its source**Workers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15,	ECETOC TRA		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2,, CS15	ECETOC TRA		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS2, CS15	ECETOC TRA		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC3, CS136	ECETOC TRA		Worker – inhalation, long-term – systemic	140,15 mg/m3	0,069

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			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,069
PROC4, CS16	ECETOC TRA		Worker – inhalation, long-term – systemic	93,43 mg/m3	0,046
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,055
PROC15, CS36	ECETOC TRA		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,023
PROC8b, CS14	ECETOC TRA		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,117
PROC8b, CS8	ECETOC TRA		Worker – inhalation, long-term – systemic	7,01 mg/m3	0,003
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,004

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

: Storage

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS2: Process sampling

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS136: Batch processes at elevated temperatures

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC15: Use as laboratory reagent

CS36: Laboratory activities

: PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

CS30: Mixing operations (open systems)

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

CS34: Manual

CS22: Transfer from/pouring from containers

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

CS39: Equipment cleaning and maintenance

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PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
 CS14: Bulk transfers

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
 CS8: Drum/batch transfers

: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 CS6: Drum and small package filling

PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;
 CS100: Production or preparation or articles by tableting, compression, extrusion or pelletization

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

1. Short title of Exposure Scenario: Use as a fuel - industrial

Main User Groups	:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	SU3: Industrial Manufacturing (all)
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental release category	:	ERC7, ERC8b: Industrial use of substances in closed systems, Wide dispersive indoor use of reactive substances in

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Further information : open systems
: Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

ERC7: Industrial use**of substances in closed systems****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)

(Msafe) : 1.800 tonnes/day

Environment factors not influenced by risk management

Flow rate : 18.000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 5 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 95 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 23,4 %)
Remarks : Risk from environmental exposure is driven by freshwater sediment.
Water : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): (Effectiveness: 0 %)
Remarks : Do not apply industrial sludge to natural soils.
Remarks : Sludge should be incinerated, contained or reclaimed.
Remarks : Common practices vary across sites thus conservative process release estimates used.
Remarks : If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m³/d
Effectiveness (of a measure) : 96,3 %
Percentage removed from waste water : 96,3 %

Conditions and measures related to external treatment of waste for disposal

Remarks : Combustion emissions limited by required exhaust emission controls.
Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery Methods : This substance is consumed during use and no waste of the

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substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Transfer via enclosed lines., Store substance within a closed system.

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Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above

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ambient temperature, unless stated differently.

Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Apply vessel entry procedures including use of forced supplied air.

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

Wear suitable coveralls to prevent exposure to the skin., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance

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Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

3. Exposure estimation and reference to its source**Workers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15, CS37,	ECETOC TRA		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2, CS15, CS37,	ECETOC TRA		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS15, CS37, CS107	ECETOC TRA		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC8b, CS8, CS14	ECETOC TRA		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,117
PROC16, CS15, CS107	ECETOC TRA		Worker – inhalation, long-term – systemic	23,36 mg/m3	0,011
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term –		0,012

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systemic Combined
routes

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS107: (closed systems)

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

CS39: Equipment cleaning and maintenance

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

CS103: Vessel and container cleaning

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS8: Drum/batch transfers

CS14: Bulk transfers

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

CS15: General exposures (closed systems)

CS107: (closed systems)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

1. Short title of Exposure Scenario: Use as a fuel – professional

Main User Groups

: **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

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Sector of use	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental release category	: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Further information	: Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

Product characteristics

Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 100 % (unless stated differently)
(Msafe)	: 240 tonnes/day

Environment factors not influenced by risk management

Flow rate	: 18.000 m ³ /d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100

Other given operational conditions affecting environmental exposure

Number of emission days per year	: 365
Emission or Release Factor: Air	: 0,1 %
Emission or Release Factor: Water	: 0,001 %
Emission or Release Factor: Soil	: 0,001 %

Technical conditions and measures / Organizational measures

Water	: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): (Effectiveness: 0 %)
Remarks Water	: Risk from environmental exposure is driven by freshwater. : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): (Effectiveness: 0 %)
Remarks	: Common practices vary across sites thus conservative process release estimates used.
Remarks	: No wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

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Flow rate of sewage treatment plant effluent : 2.000 m³/d
 Effectiveness (of a measure) : 96,3 %
 Percentage removed from waste water : 96,3 %

Conditions and measures related to external treatment of waste for disposal

Remarks : Combustion emissions limited by required exhaust emission controls.
 Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery Methods : This substance is consumed during use and no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

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Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC16: Use in closed batch process (synthesis or formulation), Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)

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Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Drain down system prior to equipment opening or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Apply vessel entry procedures including use of forced supplied air.

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

Wear suitable gloves tested to EN374., Wear suitable coveralls to prevent exposure to the skin.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)
 Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Use drum pumps or carefully pour from container., Ensure operation is undertaken outdoors., Clear transfer lines prior to de-coupling.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /

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minimise exposures and to report any skin problems that may develop.

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

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source**Workers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15,	ECETOC TRA		Worker – inhalation, long-term – systemic	0,05 mg/m ³	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2, CS15	ECETOC TRA		Worker – inhalation, long-term – systemic	93,43 mg/m ³	0,046
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,048
PROC3, CS15, CS107	ECETOC TRA		Worker – inhalation, long-term – systemic	116,79 mg/m ³	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC16, CS15, CS107			Worker – inhalation, long-term – systemic	46,72 mg/m ³	0,023
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,023
PROC8b, CS1, CS8	ECETOC TRA		Worker – inhalation, long-term – systemic	46,72 mg/m ³	0,023
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC8b, CS14			Worker – inhalation, long-term – systemic	163,51 mg/m ³	0,080
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,082

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

CS107: (closed systems)

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PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
CS15: General exposures (closed systems)
CS107: (closed systems)

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
CS39: Equipment cleaning and maintenance
CS103: Vessel and container cleaning

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS1: General exposures
CS8: Drum/batch transfers

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).