SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of the substance	Jet Fuel
Identification number	649-427-00-X
Registration number	01-2119502385-46-0021
Synonyms	Kerosene, Unmarked * Kerosene, Marked
SDS number	2008
Issue date	28-July-2011
Version number	05
Revision date	28-June-2013
Supersedes date	17-August-2012

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Distribution of a substance. Formulation & (re) packaging of substances and mixtures. Manufacture of substance. Use as a Fuel.
Uses advised against	None known.

1.3. Details of the supplier of the safety data sheet

Supplier

Company name	Valero Energy Ltd
Address	1 Westferry Circus Canary Wharf London E14 4HA UK
Telephone	01/210 345 4593 (General information; US)
e-mail	CorpHSE@valero.com
Contact person	Industrial Hygienist

1.4. Emergency telephone number 0044/(0)18 65 407333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Classification R10, Xn;R65, Xi;R38, N;R51/53

The full text for all R-phrases is displayed in section 16.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards		
Flammable liquids	Category 3	H226 - Flammable liquid and vapour.
Health hazards		
Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.
Specific target organ toxicity - single exposure	Category 3 narcotic effects	H336 - May cause drowsiness or dizziness.
Aspiration hazard	Category 1	H304 - May be fatal if swallowed and enters airways.
Environmental hazards		
Hazardous to the aquatic environment, long-term aquatic hazard	Category 2	H411 - Toxic to aquatic life with long lasting effects.

Hazard summary

Physical hazards	Flammable.
Health hazards	Harmful: may cause lung damage if swallowed. Irritating to skin.
Environmental hazards	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Specific hazards Prolonged or repeated contact with skin may cause redness, itching, irritation, eczema/chapping and oil acne. Prolonged and repeated contact with the product may cause skin cancer. Components of the product may be absorbed into the body through the skin. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. Material will float and can be re-ignited on surface of water.

Main symptoms Irritation of eyes and mucous membranes. Skin irritation. Dermatitis. Ingestion may cause irritation and malaise.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Kerosine (petroleum), sweetened

Identification number 649-427-00-X

Hazard pictograms

Signal word Danger

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

Precautionary statements

Prevention
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
P331 - Do NOT induce vomiting.

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

Disposal P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information Not applicable.

2.3. Other hazards

Static accumulator - Static accumulating flammable materials can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite material and vapor may cause flash fire (or explosion).

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Kerosine (petroleum), sweetened	100	91770-15-9 294-799-5	01-2119502385-46-0021	649-427-00-X	

Classification: **DSD:** R10, Xn;R65, Xi;R38, N;R51/53

CLP: Flam. Liq. 3;H226, Asp. Tox. 1;H304, Skin Irrit. 2;H315, STOT SE 3;H336, Aquatic Chronic 2;H411

CLP: Regulation No. 1272/2008.
DSD: Directive 67/548/EEC.

Composition comments The product is a UVCB substance. The full text for all R- and H-phrases is displayed in section 16. All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4: First aid measures

General information If exposed or concerned: get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use.

4.1. Description of first aid measures

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Skin contact Remove contaminated clothing and shoes. Wash off immediately with soap and plenty of water. Get medical attention if irritation develops or persists. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes. If high pressure injection under the skin occurs, always seek medical attention.

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.
Ingestion	Rinse mouth thoroughly. Do not induce vomiting without advice from poison control centre. Do not give mouth-to-mouth resuscitation. Get medical attention immediately.
4.2. Most important symptoms and effects, both acute and delayed	Skin irritation. Defatting of the skin. Rash. May cause eye irritation on direct contact. Cyanosis (blue tissue condition, nails, lips, and/or skin). Narcosis. Unconsciousness. Decrease in motor functions. Behavioural changes. Aspiration may cause pulmonary oedema and pneumonitis. Jaundice. Liver enlargement. Oedema. Proteinuria.
4.3. Indication of any immediate medical attention and special treatment needed	Treat symptomatically. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards	The product is flammable, and heating may generate vapours which may form explosive vapour/air mixtures. Containers may explode when heated.
5.1. Extinguishing media	
Suitable extinguishing media	Water spray. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO_2).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
5.2. Special hazards arising from the substance or mixture	Vapor may cause flash fire. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.
5.3. Advice for firefighters	
Special protective equipment for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Special fire fighting procedures	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Withdraw immediately in case of rising sound from venting safety devices or any discolouration of tanks due to fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray. Cool containers exposed to flames with water until well after the fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Vapours may form explosive air mixtures even at room temperature. Prevent buildup of vapours or gasses to explosive concentrations. Some of these materials, if spilled, may evaporate leaving a flammable residue. Water runoff can cause environmental damage.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
For emergency responders	Keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this safety data sheet.
6.2. Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire and Explosion Hazard Data before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies.

6.3. Methods and material for containment and cleaning up

Extinguish all flames in the vicinity.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Small Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Cover with plastic sheet to prevent spreading. Following product recovery, flush area with water. Clean surface thoroughly to remove residual contamination. Wipe up with absorbent material (e.g. cloth, fleece).

Never return spills in original containers for re-use. Prevent entry into waterways, sewers, basements or confined areas. Stop leak if you can do so without risk. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Should not be released into the environment. This material and its container must be disposed of as hazardous waste. Use non-sparking tools and explosion-proof equipment.

6.4. Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability. Provide adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapours. Wear appropriate personal protective equipment. The product is flammable, and heating may generate vapours which may form explosive vapour/air mixtures. Ground container and transfer equipment to eliminate static electric sparks. Vapours are heavier than air and may travel along the floor and in the bottom of containers. Immediately change contaminated clothes. Do not eat, drink or smoke when using the product. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Follow rules for flammable liquids. Keep away from heat, sparks and open flame. Keep in a cool, well-ventilated place. Keep away from food, drink and animal feeding stuffs. Store away from incompatible materials.

7.3. Specific end use(s)

For detailed information, see section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Belgium. Exposure Limit Values.

Material	Type	Value	Form
Jet Fuel (CAS 91770-15-9)	TWA	200 mg/m3	Vapor.

Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work

Material	Type	Value
Jet Fuel (CAS 91770-15-9)	TWA	300 mg/m3

Italy. OELs

Material	Type	Value	Form
Jet Fuel (CAS 91770-15-9)	TWA	200 mg/m3	Non-aerosol.

Poland. MACs. Minister of Labour and Social Policy Regarding Maximum Allowable Concentrations and Intensities in Working Environment

Material	Type	Value
Jet Fuel (CAS 91770-15-9)	STEL	300 mg/m3
	TWA	100 mg/m3

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no-effect level (DNEL)

Material	Type	Route	Value	Form
Jet Fuel (CAS 91770-15-9)	Workers	Inhalation	40 mg/kg/24h	Long term exposure systemic effects

Predicted no effect concentrations (PNECs)

Not available.

8.2. Exposure controls

Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment.

Individual protection measures, such as personal protective equipment

General information	Use personal protective equipment as required. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Keep working clothes separately. Launder contaminated clothing before reuse.
Eye/face protection	Wear safety glasses. If splash potential exists, wear full face shield or chemical goggles.
Skin protection	
- Hand protection	Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Wear suitable gloves tested to EN374.
- Other	Wear chemical-resistant, impervious gloves. Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended.
Respiratory protection	Wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. In case of inadequate ventilation or risk of inhalation of vapours, use suitable respiratory equipment with gas filter (type A2). Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.
Thermal hazards	When material is heated, wear gloves to protect against thermal burns.
Hygiene measures	Consult supervisor for special handling instructions. Avoid contact with eyes. Avoid contact with skin. Wash hands before breaks and immediately after handling the product. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practices.
Environmental exposure controls	Contain spills and prevent releases and observe national regulations on emissions.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Colourless liquid.
Physical state	Liquid.
Form	Liquid.
Colour	Colourless.
Odour	Kerosene (strong).
Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	90 - 320 °C (194 - 608 °F)
Flash point	29,0 - 70,0 °C (84,2 - 158,0 °F)
Evaporation rate	No data available.
Flammability (solid, gas)	Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	0,7 % v/v
Flammability limit - upper (%)	5 % v/v
Vapour pressure	<1 - 3,7 (kPa) (37,8°C)
Vapour density	5,7
Relative density	750 - 840 kg/m3 (15°C)
Solubility(ies)	Insoluble in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	220 - 250 °C (428 - 482 °F)
Decomposition temperature	Not available.
Viscosity	1 - 2,4 cSt (40°C)
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

9.2. Other information

Density 0,77 - 0,85 g/cm³ (15°C)

SECTION 10: Stability and reactivity

10.1. Reactivity The product is stable and non reactive under normal conditions of use, storage and transport.

10.2. Chemical stability Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions Hazardous reactions do not occur.

10.4. Conditions to avoid Heat, flames and sparks. Ignition sources. Contact with incompatible materials. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.

10.5. Incompatible materials Strong acids. Strong oxidizers such as nitrates, chlorates, peroxides.

10.6. Hazardous decomposition products Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Ingestion Ingestion may cause irritation and malaise. Swallowing or vomiting of the liquid may result in aspiration into the lungs.

Inhalation Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness.

Skin contact Causes skin irritation. Repeated exposure may cause skin dryness or cracking. May be absorbed through the skin.

Eye contact Direct contact with eyes may cause temporary irritation.

Symptoms May cause eye irritation on direct contact. Narcosis. Unconsciousness. Behavioural changes. Decrease in motor functions. Cyanosis (blue tissue condition, nails, lips, and/or skin). Jaundice. Proteinuria. Liver enlargement. Conjunctivitis. Corneal damage. Defatting of the skin. Rash. Oedema.

11.1. Information on toxicological effects

Acute toxicity Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. May irritate and cause stomach pain, vomiting, diarrhoea and nausea. Human evidence indicates that the product has very low acute oral, dermal or inhalation toxicity. However, it can produce severe injury if taken into the lung as a liquid, and there may be profound central nervous system depression following prolonged exposure to high levels of vapour.

Product	Species	Test results
Jet Fuel (CAS 91770-15-9)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	> 5280 mg/m3
Oral		
LD50	Rat	> 5000 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Based on available data, the classification criteria are not met.

Respiratory sensitisation Based on available data, the classification criteria are not met.

Skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

Specific target organ toxicity - single exposure Based on available data, the classification criteria are not met.

Specific target organ toxicity - repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard May be fatal if swallowed and enters airways.

Mixture versus substance information	Not applicable.
Other information	Symptoms may be delayed.

SECTION 12: Ecological information

12.1. Toxicity Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product		Species	Test results
Jet Fuel (CAS 91770-15-9)			
Aquatic			
Algae	EL50	Algae	1 - 3 mg/l, 72 Hours
Crustacea	EL50	Daphnia magna	1,4 mg/l, 48 Hours
Fish	LL50	Oncorhynchus mykiss	2 - 5 mg/l, 96 Hours

12.2. Persistence and degradability	An evaluation of representative hydrocarbon structures indicates some structures meet the persistent (P) or very persistent (vP) criteria.
12.3. Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating.
Partition coefficient n-octanol/water (log Kow)	Not available.
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	Not available.
Mobility in general	The product is insoluble in water. It will spread on the water surface while some of the components will eventually sediment in water systems. The volatile components of the product will spread in the atmosphere.
12.5. Results of PBT and vPvB assessment	Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects	Toxic to aquatic life with long lasting effects. The product contains volatile organic compounds which have a photochemical ozone creation potential. Oil spills are generally hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU waste code	13 07 02* 13 07 03* Waste codes should be assigned by the user based on the application for which the product was used.
Disposal methods/information	Dispose in accordance with all applicable regulations. This material and its container must be disposed of as hazardous waste. Do not discharge into drains, water courses or onto the ground.

SECTION 14: Transport information

ADR

14.1. UN number	UN1223
14.2. UN proper shipping name	Kerosene
14.3. Transport hazard class(es)	3
Subsidiary class(es)	-
14.4. Packing group	III
14.5. Environmental hazards	Yes
Tunnel restriction code	D/E
Labels required	3
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

RID

14.1. UN number	UN1223
14.2. UN proper shipping name	Kerosene
14.3. Transport hazard class(es)	3
Subsidiary class(es)	-

14.4. Packing group	III
14.5. Environmental hazards	Yes
Labels required	3
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

ADN

14.1. UN number	UN1223
14.2. UN proper shipping name	Kerosene
14.3. Transport hazard class(es)	3
Subsidiary class(es)	-
14.4. Packing group	III
14.5. Environmental hazards	Yes
Labels required	3
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

14.1. UN number	UN1223
14.2. UN proper shipping name	Kerosene
14.3. Transport hazard class(es)	3
Subsidiary class(es)	-
14.4. Packing group	III
14.5. Environmental hazards	Yes
Labels required	3
ERG code	3L
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

14.1. UN number	UN1223
14.2. UN proper shipping name	KEROSENE
14.3. Transport hazard class(es)	3
Subsidiary class(es)	-
14.4. Packing group	III
14.5. Environmental hazards	
Marine pollutant	Yes
Labels required	3
EmS	F-E, S-E
14.6. Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work

Not regulated.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding

Not regulated.

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not regulated.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Kerosine (petroleum), sweetened (CAS 91770-15-9)

Directive 94/33/EC on the protection of young people at work

Not listed.

Other regulations	The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended and respective national laws implementing EC directives. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. 96/82/EC (Seveso II) Directive; Part 2 (Classified Substances) - Dangerous for the Environment (i)
National regulations	Follow national regulation for work with chemical agents.
15.2. Chemical safety assessment	For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

List of abbreviations	DSD: Directive 67/548/EEC. CLP: Regulation No. 1272/2008. DNEL: Derived No-Effect Level. PNEC: Predicted No-Effect Concentration. PBT: Persistent, bioaccumulative and toxic. vPvB: Very Persistent and very Bioaccumulative. eSDS: extended Safety Data Sheet. STP: Sewage Treatment Plant.
References	Chemical safety report. CLP files – http://concawe.org/
Information on evaluation method leading to the classification of mixture	The mixture is classified based on test data for physical hazards. The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details, refer to Sections 9, 11 and 12.
Full text of any statements or R-phrases and H-statements under Sections 2 to 15	R10 Flammable. R38 Irritating to skin. R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R65 Harmful: may cause lung damage if swallowed. H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H336 May cause drowsiness or dizziness. H411 Toxic to aquatic life with long lasting effects.
This SDS contains revisions in the following section(s):	This safety data sheet contains revisions in the following section(s): 1, 3, 4, 6, 7, 8, 9, 11, 12, 14, 16.
Training information	Follow training instructions when handling this material.

Disclaimer

This material Safety Data Sheet (SDS) was prepared in accordance with EC No 1272/2008 by Valero Energy Ltd. Valero Energy Ltd. does not assume any liability arising out of product use by others. The information, recommendations, and suggestions presented in this SDS are based upon test results and data believed to be reliable. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all the scientific and study information in the format of this document, plus additional information may be necessary under exceptional conditions of use, or because of applicable laws or government regulations.

Annex to the extended Safety Data Sheet (eSDS)

1 - Exposure Scenario Worker

1. Distribution of substance

List of use descriptors

Sector(s) of Use	SU3: Industrial uses.
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of substances. . ERC2: Formulation of preparations. ERC3: Formulation in materials. ERC4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC5: Industrial use resulting in inclusion into or onto a matrix. ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC6b: Industrial use of reactive processing aids. ERC6c: Industrial use of monomers for manufacture of thermoplastics. ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC7: Industrial use of substances in closed systems. Specific Environmental Release Category: ESVOC SpERC 1.1b.v1
List of names of contributing worker scenarios and corresponding PROCs	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. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC15: Use as laboratory reagent.

Further explanations

Other Process or activity	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.

2.1. Contributing exposure scenario controlling environmental exposure for Manufacture of substances.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	5,4 e6
Fraction of Regional tonnage used locally:	0,002
Annual site tonnage (tons/year):	1,1 e4
Maximum daily site tonnage (kg/day):	3,6 e4

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors Air	Soil	Water	Remarks
initial release prior to RMM	300	0,001	0,00001	0,00001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

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

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. No wastewater treatment required.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,7
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 2,6e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,7

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not available.
Remarks	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA

Use in closed, continuous process with occasional controlled exposure.
Use in closed batch process (synthesis or formulation).
Use in batch and other process (synthesis) where opportunity for exposure arises.
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
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).
Use as laboratory reagent.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Process temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8	1 hours per day	Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas

Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not available.
Technical conditions and measures to control dispersion from source towards the worker	Not available.
Organizational measures to prevent/limit releases, dispersion and exposure	Not available.
Conditions and measures related to personal protection, hygiene and health evaluations	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

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 ppm	0	**	Inhalation Exposure
General exposures (closed systems)	10 ppm	0.250	**	Inhalation Exposure
General exposures (closed systems)	25 ppm	0.625	**	Inhalation Exposure

General exposures (open systems)	20 ppm	0.500	**	Inhalation Exposure
Process sampling	25 ppm	0.625	**	Inhalation Exposure
Laboratory activities	10 ppm	0.250	**	Inhalation Exposure
Bulk transfers	5 ppm	0.125	**	Inhalation Exposure
Drum and small package filling	50 ppm	0.125	**	Inhalation Exposure
Equipment cleaning and maintenance	50 ppm	0.250	**	Inhalation Exposure
Bulk product storage	10 ppm	0.250	**	Inhalation Exposure

** - The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

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).

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.

Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

2 - Exposure Scenario Worker

1. Formulation [mixing] of preparations and/or re-packaging

List of use descriptors

Sector(s) of Use	SU3: Industrial uses. SU10: Formulation [mixing] of preparations and/or re-packaging.
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC2: Formulation of preparations. Specific Environmental Release Category: ESVOC SpERC 2.2.v1
List of names of contributing worker scenarios and corresponding PROCs	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. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation . PROC15: Use as laboratory reagent.
Further explanations	
Other Process or activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1. Contributing exposure scenario controlling environmental exposure for Formulation of preparations.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.
Amounts used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	5,2 e6
Fraction of Regional tonnage used locally:	0,0058
Annual site tonnage (tons/year):	3 e4
Maximum daily site tonnage (kg/day):	1 e5
Frequency and duration of use	
Batch process	Not available.
Continuous process	Emission days (days/year): 300
Environment factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,01	0,0002	0,0001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

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

Air	Treat air emission to provide a typical removal efficiency of (%): 0
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 86,0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,7
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 2,6e5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,7

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not available.
Remarks	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA

Use in closed, continuous process with occasional controlled exposure.
Use in closed batch process (synthesis or formulation).
Use in batch and other process (synthesis) where opportunity for exposure arises.
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
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).
Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Use as laboratory reagent.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Process temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8	1 hours per day	Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas

Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not available.
Technical conditions and measures to control dispersion from source towards the worker	Not available.
Organizational measures to prevent/limit releases, dispersion and exposure	Not available.
Conditions and measures related to personal protection, hygiene and health evaluations	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

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 ppm	0	**	Inhalation Exposure
General exposures (closed systems)	10 ppm	0.250	**	Inhalation Exposure

General exposures (closed systems)	25 ppm	0.625	**	Inhalation Exposure
General exposures (open systems)	20 ppm	0.500	**	Inhalation Exposure
Process sampling	25 ppm	0.625	**	Inhalation Exposure
Laboratory activities	10 ppm	0.250	**	Inhalation Exposure
Bulk transfers	5 ppm	0.125	**	Inhalation Exposure
Mixing operations (open systems)	50 ppm	0.125	**	Inhalation Exposure
Manual / Transfer from/pouring from containers.	50 ppm	0.125	**	Inhalation Exposure
Drum/batch transfers	50 ppm	0.38	**	Inhalation Exposure
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	50 ppm	0.125	**	Inhalation Exposure
Drum and small package filling	50 ppm	0.125	**	Inhalation Exposure
Equipment cleaning and maintenance	50 ppm	0.250	**	Inhalation Exposure
Bulk product storage	10 ppm	0.250	**	Inhalation Exposure

** - The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

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).

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.

Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3 - Exposure Scenario Worker

1. Manufacture of substances

List of use descriptors

Sector(s) of Use	SU3: Industrial uses. SU8: Manufacture of bulk, large scale chemicals (including petroleum products). SU9: Manufacture of fine chemicals.
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of substances. ERC4: Industrial use of processing aids in processes and products, not becoming part of articles. Specific Environmental Release Category: ESVOC SpERC 1.1.v1
List of names of contributing worker scenarios and corresponding PROCs	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. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC15: Use as laboratory reagent.
Further explanations	
Other Process or activity	Manufacture of substance or use as an intermediate, process chemical or extracting agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1. Contributing exposure scenario controlling environmental exposure for Manufacture of substances.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.
Amounts used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	5,4 e6
Fraction of Regional tonnage used locally:	0,11
Annual site tonnage (tons/year):	6 e5
Maximum daily site tonnage (kg/day):	2 e6
Frequency and duration of use	
Batch process	Not available.
Continuous process	Emission days (days/year): 300
Environment factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,01	0,0001	0,0003	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

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

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 97,7. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 56,1
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. Onsite wastewater treatment required.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Municipal STP
Discharge rate	10000
Treatment effectiveness	94,7
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 2,0e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97,7

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not available.
Remarks	During manufacturing no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	During manufacturing no waste of the substance is generated to recover.
Treatment effectiveness	Not available.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Use in batch and other process (synthesis) where opportunity for exposure arises. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Use as laboratory reagent.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature).

Amounts used

Not available.

Frequency and duration of use

Not available.

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Not available.

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not available.
Technical conditions and measures to control dispersion from source towards the worker	Not available.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures (skin irritants); 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 evaluations	Not available.

3. Exposure Estimation

Environment

Not available.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 ppm	0	**	Inhalation Exposure
General exposures (closed system) + With sample collection	10 ppm	0.250	**	Inhalation Exposure
General exposures (closed systems)	25 ppm	0.625	**	Inhalation Exposure
General exposures (open systems)	20 ppm	0.500	**	Inhalation Exposure
Bulk transfers	5 ppm	0.125	**	Inhalation Exposure
Sample collection	25 ppm	0.625	**	Inhalation Exposure
Laboratory activities	10 ppm	0.250	**	Inhalation Exposure
Clean down and Maintenance	50 ppm	0.250	**	Inhalation Exposure
Storage	10 ppm	0.250	**	Inhalation Exposure

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

Environment

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).

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.

Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4 - Exposure Scenario Worker

1. Use as a fuel

List of use descriptors

Sector(s) of Use	SU3: Industrial uses.
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC7: Industrial use of substances in closed systems. Specific Environmental Release Category: ESVOC SpERC 7.12a.v1
List of names of contributing worker scenarios and corresponding PROCs	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). PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-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.
Further explanations	
Other Process or activity	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1. Contributing exposure scenario controlling environmental exposure for Industrial use of substances in closed systems.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	5,5 e5
Fraction of Regional tonnage used locally:	1
Annual site tonnage (tons/year):	5,5 e5
Maximum daily site tonnage (kg/day):	1,8 e6

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,005	0	0,00001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

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

Air	Treat air emission to provide a typical removal efficiency of (%): 95
Soil	Not available.

Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 84,6. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,7
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 5,3e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,7

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not available.
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

Fraction of used amount transferred to external waste treatment

Suitable recover operations	This substance is consumed during use and no waste of the substance is generated.
Treatment effectiveness	Not available.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Using material as fuel sources, limited exposure to unburned product to be expected.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP.
Process temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8	1 hours per day	Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not available.
Technical conditions and measures to control dispersion from source towards the worker	Not available.
Organizational measures to prevent/limit releases, dispersion and exposure	Not available.
Conditions and measures related to personal protection, hygiene and health evaluations	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

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	10 ppm	0.250	**	Inhalation Exposure
General exposures (closed systems)	25 ppm	0.625	**	Inhalation Exposure
Transport	5 ppm	0.125	**	Inhalation Exposure
Bulk transfers	50 ppm	0.875	**	Inhalation Exposure
Drum/batch transfers	50 ppm	0.875	**	Inhalation Exposure
Equipment cleaning and maintenance	50 ppm	0.250	**	Inhalation Exposure
Vessel and container cleaning	50 ppm	0.125	**	Inhalation Exposure
Bulk product storage	10 ppm	0.250	**	Inhalation Exposure

** - The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment

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).

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.

Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.