

SAFETY DATA SHEET



Revision: 5.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

JET KEROSENE V3013a

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name Kerosene (petroleum) sweetened
Product Description V3013-JET KEROSENE-Kerosene (petroleum) sweetened
Trade Name JET KEROSENE
Product code JET
CAS No. 91770-15-9
EC No. 294-799-5
REACH Registration No. -

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

Identified Use(s)

No.	Exposure Scenario	Page:
1	Distribution of Kerosene (petroleum) sweetened (industrial)	11
2	Formulation and (re)packing of Kerosene (petroleum) sweetened (industrial)	14
3	Use of Kerosene (petroleum) sweetened as a fuel (industrial)	17
4	Use of Kerosene (petroleum) sweetened as a fuel (professional)	20
5	Use of Kerosene (petroleum) sweetened as a fuel (consumer)	23

Uses Advised Against

Anything other than the above.

1.3 Details of the supplier of the safety data sheet

Company Identification

Vitol SA
Place des Bergues 3
P.O. Box 2056
1211 Geneva 1
Switzerland

Telephone

+31 10 498 7200

Fax

+31 10 452 9545

E-Mail (competent person)

xreach@vitol.com

1.4 Emergency telephone number

Emergency Phone No.

+44 (0) 1235 239 670, 24/7

Languages spoken

All official European languages.

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation (EC) No. 1272/2008 (CLP)

Flam. Liq. 3; H226
Asp. Tox. 1; H304
Skin Irrit. 2; H315
STOT RE 2; H336 (Central nervous system, Inhalation)
Aquatic Chronic 2; H411

2.2 Label elements

Product Name

According to Regulation (EC) No. 1272/2008 (CLP)
V3013-JET KEROSENE-Kerosene (petroleum) sweetened

Hazard Pictogram(s)



Signal Word(s)

Danger

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Hazard Statement(s) 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 Statement(s) P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P273: Avoid release to the environment.

2.3 Other hazards May form explosive mixture with air. The vapour is heavier than air; beware of pits and confined spaces. Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

SUBSTANCE	CAS No.	EC No.	REACH Registration No.	%W/W
Kerosene (petroleum) sweetened	91770-15-9	294-799-5	-	100

SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Self-protection of the first aider

Eliminate sources of ignition. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance.

H2S Warning:

Hydrogen sulphide (H₂S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

Inhalation

If there is any suspicion of inhalation: A self contained breathing apparatus should be worn. Remove to fresh air immediately.

Skin Contact

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical advice/attention if you feel unwell.

Eye Contact

IF ON SKIN (or hair): Remove contaminated clothing immediately and wash affected skin with plenty of water or soap and water. If irritation (redness, rash, blistering) develops, get medical attention.

Ingestion

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs. If unconscious, place in recovery position and get medical attention immediately. Do not give anything by mouth to an unconscious person. Get medical attention immediately. Do not wait for symptoms to appear.

Inhalation: Irritation of the respiratory tract.
Skin Contact: Causes skin irritation.

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4.3 Indication of any immediate medical attention and special treatment needed Notes to a physician:	Eye Contact: Slightly irritant to eyes. Ingestion: Aspiration into the lungs may cause chemical pneumonitis, which can be fatal. Ingestion may cause irritation of the gastrointestinal tract. Nausea, Vomiting and Diarrhoea. Treat symptomatically. IF INHALED: If unconscious, place in recovery position and get medical attention immediately. Administer oxygen if available and artificial respiration if necessary. IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If aspiration is suspected obtain immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs.
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SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media Suitable Extinguishing media	Extinguish with sand or dry chemical. Foam, Carbon dioxide, Water fog or dry powder
Unsuitable extinguishing media	Do not use water jet. Direct water jet may spread the fire.
5.2 Special hazards arising from the substance or mixture	Flammable liquid and vapour. Will float and can be reignited on surface water. Decomposes in a fire giving off toxic fumes: A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. May form explosive mixture with air. Prevent liquid entering sewers, basements and any watercourses. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. If sulphur compounds are present in appreciable amounts, combustion products may include also H ₂ S and SO _x (sulfur oxides) or sulfuric acid
5.3 Advice for fire-fighters	Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment. Dike fire control water for later disposal.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures	Caution - spillages may be slippery. Eliminate sources of ignition. Stop leak if safe to do so. Ensure suitable personal protection during removal of spillages. See Section: 8. Avoid all contact. Do not breathe fumes/vapour. Keep upwind. Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact with substance. Ensure adequate ventilation. Do not breathe vapour. Do not ingest. If swallowed then seek immediate medical assistance. All official European languages. Do not use sparking tools. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems.
H ₂ S Warning:	Product may release Hydrogen Sulphide. Exposure controls - These controls may include: Segregation of areas, Access only to authorised persons, Permit to work systems, Confined space working procedures, Area H ₂ S alarms, Personal H ₂ S alarms, Personal escape sets, H ₂ S awareness training. Please see section 8 for appropriate personal protection equipment
Small spillages: Large spillages:	Wear flame-resistant antistatic protective clothing. Evacuate the area and keep personnel upwind. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. Avoid all contact. Wear chemical protection suit and breathing apparatus. See Also Section: 8.
6.2 Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If necessary: Dike area to contain the spill and prevent releases to sewers, drains, or other waterways.

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6.3	Methods and material for containment and cleaning up	Provided it is safe to do so, isolate the source of the leak. Use non-sparking equipment when picking up flammable spill. The vapour is heavier than air; beware of pits and confined spaces. Ensure that the equipment is adequately grounded. Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Wear chemical protection suit and breathing apparatus.
	Spillages onto land:	In case of soil contamination, remove contaminated soil and treat in accordance with local regulations. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a lidded container for disposal or recovery. Dispose of this material and its container as hazardous waste. Small spillages: Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Large spillages: Cover spillage with foam to reduce evaporation. Do not use water jet.
	Spillages on water or at sea:	Collect as much as possible in clean container for reuse or disposal. Small spillages: Contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. Large spillages: Open waters should be contained with floating barriers or other mechanical means and recovered, only if this is strictly necessary and if fire/explosion risks can be adequately prevented. Otherwise control the spreading of the spillage, and let the substance evaporate naturally.
6.4	Reference to other sections	See Section: 8,13

SECTION 7: HANDLING AND STORAGE

7.1	Precautions for safe handling	Obtain special instructions before use. Keep away from sources of ignition - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. May form explosive mixtures with air. Take action to prevent static discharges. Use non-sparking tools. All parts of the plant and equipment should be electrically bonded together and connected to earth. Electrical continuity should be checked at regular intervals. Antistatic clothing and footwear should be used. The vapour is heavier than air; beware of pits and confined spaces. Avoid all contact with substance. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe vapour. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned.
	H2S Warning:	Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances. These controls may include: Segregation of areas, Access only to authorised persons, Permit to work systems, Confined space working procedures, Area H2S alarms, Personal H2S alarms, Personal escape sets, H2S awareness training.
7.2	Conditions for safe storage, including any incompatibilities	Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.
	Storage temperature	Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources.
	Storage measures	Keep only in original container. Suitable containers: Mild steel, Stainless steel
	Incompatible materials	Keep away from oxidising agents. Unsuitable containers: Synthetic materials
7.3	Specific end use(s)	See Section: 1.2 and/or Exposure Scenario.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1	Control parameters	
8.1.1	Occupational Exposure Limits	None assigned.

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8.1.2	Biological limit value	Not established.
8.1.3	PNECs and DNELs	<p>PNEC: Kerosene (petroleum) sweetened is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the environmental toxicity (HC5) of each group of components in the substance. These are used to estimate the environmental risk for the substance. Therefore individual environmental compartments PNECs are not available for this product.</p> <p>DNEL: Not established.</p>
8.2	Exposure controls	
8.2.1	Appropriate engineering controls	Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Guarantee that the eye flushing systems and safety showers are located close to the working place.
8.2.2	Individual protection measures, such as personal protective equipment (PPE)	<p>Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.</p> <p>Fuels are typically used, transferred and transported in closed systems. If exposure is likely (i.e. during sampling) the following advice may be appropriate. Keep good industrial hygiene. Always wash hands before smoking, eating and drinking. Do not eat, drink or smoke at the work place.</p> <p>Refer to annexes for exposure scenarios detailing use specific exposure controls</p>
	Eye/ face protection	Use eye protection according to EN 166, designed to protect against liquid splashes.
		
	Skin protection	Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Recommended: Nitrile rubber.
		
	Respiratory protection	Body protection: Wear anti-static clothing and shoes. small scale: Wear suitable coveralls to prevent exposure to the skin. large scale: Chemical protection suit.
		
	Thermal hazards	When the product is heated /In case of inadequate ventilation wear respiratory protection. The use of a high efficiency filter (EN143) is recommended. Filter type A2
		Closed system(s): Not normally required.
		Not applicable.
8.2.3	Environmental Exposure Controls	Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1	Information on basic physical and chemical properties	
	Appearance	Liquid. Almost colourless to pale yellow.
	Odour	Characteristic.
	Odour threshold	Not established.
	pH	Not established.

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Melting point/freezing point	> - 49 °C
Initial boiling point and boiling range	150 – 290 °C @ 101 kPa
Flash point	23 - 59 °C @ 101 kPa
Evaporation rate	Not established.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Flammable Limits (Lower) (%v/v) 0.7 Flammable Limits (Upper) (%v/v) 5
Vapour pressure	≤ 1 kPa @ 40°C
Vapour density	4.7 - 5 (Air = 1)
Relative density	0.77 – 0.85 g/cm ³ @ 15 °C
Solubility(ies)	Practically insoluble.
Partition coefficient: n-octanol/water	3.3 – 6.0
Auto-ignition temperature	> 210 °C @ 101 kPa
Decomposition Temperature	Not established.
Viscosity	< 7 mm ² /s @ 40 °C
Explosive properties	Not explosive.(Vapour may create explosive atmosphere.)
Oxidising properties	Not oxidising.

9.2 Other information None known.

SECTION 10: STABILITY AND REACTIVITY

10.1 Stability and reactivity	Stable under normal conditions. Reacts with - Strong oxidising agents
10.2 Chemical stability	Stable under normal conditions. Hazardous polymerisation will not occur. Product may release Hydrogen Sulphide.
10.3 Possibility of hazardous reactions	Extremely flammable liquid and vapour. May form explosive mixture with air. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Product may release Hydrogen Sulphide.
10.4 Conditions to avoid	Elevated temperature. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight.
10.5 Incompatible materials	Keep away from oxidising agents. Strong Acids and Alkalis.
10.6 Hazardous decomposition product(s)	A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. Decomposes in a fire giving off toxic fumes: COx, H ₂ S, SO _x ,

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects	All test data taken from existing ECHA registrations for the substances mentioned.
Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. LD50 > 5000 mg/kg bw/day (rat) (OECD 420)
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. LC50 (inhalation, rat) mg/l/4h: >5.28 No mortality observed (OECD 403)
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. LD50 > 2000 mg/kg bw/day (rabbit) (OECD 402)
Skin corrosion/irritation	Skin Irrit. 2; Causes skin irritation. Irritating to skin. (rabbit) (Unnamed, 1986)
Serious eye damage/irritation	Based upon the available data, the classification criteria are not met. Not irritating to eyes. (rabbit) (EPA OTS 798.4500)
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met. Sensitisation (guinea pig) - Negative (OECD 406)
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met. In vitro: Negative (OECD 479)
Carcinogenicity	In vivo: Positive (males) Negative (females) (mouse) (Unnamed, 1988)
Reproductive toxicity	Based upon the available data, the classification criteria are not met. ECHA Registration Endpoint summary: Not classified
STOT - single exposure	Based upon the available data, the classification criteria are not met. ECHA Registration Endpoint summary: Not classified for reproductive or developmental toxicity. STOT SE 3; May cause drowsiness or dizziness.
STOT - repeated exposure	Weight of evidence approach. Based upon the available data, the classification criteria are not met.

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	Oral: NOAEL 750 mg/kg bw/day (rat) (OECD 408)
	Inhalation: No adverse effect observed (rat) (OECD 413) NOAEL \geq 1000 mg/m ³
Aspiration hazard	Dermal: Causes skin irritation. (rat) (OECD 411) NOAEL \geq 495 mg/kg bw/day Asp. Tox. 1; May be fatal if swallowed and enters airways. Viscosity: < 7 mm ² /s @ 40 °C
11.2 Other information	None.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity	Aquatic Chronic 2; Toxic to aquatic life with long lasting effects.
Short Term (acute):	NOEL (Fish) (96hr) 2.0 mg/l (OCED 203)
Long Term (Chronic):	The aquatic toxicity was estimated using the PETROTOX computer model. Estimated: NOEL 0.098 mg/l
12.2 Persistence and degradability	Readily biodegradable (according to OECD criteria). OECD 301F
12.3 Bioaccumulative potential	The product has potential for bioaccumulation. LogKow 4.0
12.4 Mobility in soil	The product is predicted to have low mobility in soil. Insoluble.
12.5 Results of PBT and vPvB assessment	Not classified as PBT or vPvB.
12.6 Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods	Dispose of this material and its container as hazardous waste. Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue. Containers must not be punctured or destroyed by burning, even when empty. Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.
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SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG/ADN
14.1 UN number	UN 1863	UN 1863
14.2 Proper Shipping Name	FUEL, AVIATION, TURBINE ENGINE	FUEL, AVIATION, TURBINE ENGINE
14.3 Transport hazard class(es)	3	3 (N2, F)
14.4 Packing group	III	III
14.5 Environmental hazards	MILIEUGEVAARLIJK / ENVIRONMENTALLY HAZARDOUS/ UMWELTGEFÄHREND / DANGEREUX POUR / L'ENVIRONNEMENT	
14.6 Special precautions for user	See Section: 2	
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	This product is being carried under the scope of MARPOL Annex 1. Special Precautions: Refer to Chapter 7 'Handling and Storage' for special precautions which a user needs to be aware of, or needs to comply with, in connection with transport.	
14.8 Additional Information	HIN: 30 Tunnel Code: 3 (D/E) Limited Quantity: 5L	EmS: F-E, S-E Limited Quantity: 5L

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1 EU regulations	
Seveso	Upper Tier: 25000 tonnes Lower Tier: 2500 tonnes
15.1.2 National regulations	

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Germany

Wassergefährdungsklasse (Germany). WGK number: 3

15.2 Chemical Safety Assessment

A REACH chemical safety assessment (CSA) has been carried out. Refer to annexes for exposure scenarios detailing use specific exposure controls.

SECTION 16: OTHER INFORMATION

Sections indicated with the following have been revised

Header and Section 1.3

Updated version and date. Please review SDS with care.

References:

Existing ECHA registration(s) for Kerosene (petroleum) sweetened (CAS No. 91770-15-9) and Chemical Safety Report.

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

LEGEND

LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
PBT	PBT: Persistent, Bioaccumulative and Toxic
vPvB	very Persistent and very Bioaccumulative
OECD	Organisation for Economic Cooperation and Development
ES	Exposure Scenario
NOAEC	no observed adverse effect concentration
NOAEL	No Observed Adverse Effect Level

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Disclaimers

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Annex to the extended Safety Data Sheet (eSDS)

See below -

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Kerosene (petroleum) sweetened

CAS No.
EC No.

91770-15-9
294-799-5

Summary of Parameters

Physical parameters			
Vapour pressure (hPa)		1 – 21 at 37.8 °C Value used for exposure estimation = 1.2E+03 Pa	
Partition coefficient (log K _{OW})		1.99 – 18.02	
Aqueous solubility (mg/l)		Value used for exposure estimation = 3.8E+01 mg/l	
Molecular weight		Not applicable m.w. = 128 used for exposure estimation	
Biodegradability		Inherently biodegradable, not fulfilling criteria	
Human Health (DNEL)			
Workers	Short term	Inhalation (mg/m ³)	No hazard identified
		Dermal (mg/kg bw/day)	No hazard identified
	Long term	Inhalation (mg/m ³)	40 ppm used for risk estimation
		Dermal (mg/kg bw/day)	No hazard identified
Consumer	Inhalation (mg/m ³)		40 used for risk estimation
	Dermal (mg/kg bw/day)		No hazard identified
	Oral (mg/kg bw/day)		18.8
Environmental Parameters (PNECs)			
Kerosene (petroleum) sweetened is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the environmental toxicity (HC5) of each group of components in the substance. These are used to estimate the environmental risk for the substance. Therefore a PNEC is not available for Fuels, diesel for individual environmental compartments.			

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Contributing Scenarios

Workers

- PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
- PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
(Storage) Use in closed, continuous process with occasional controlled exposure, bulk storage.
- PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
(Sampling) Use in closed batch process (synthesis or formulation). Sample collection at ventilation at ventilated sample points.
- PROC4 Chemical production where opportunity for exposure arises.
- PROC5 Mixing or blending in batch processes.
- PROC8a (manual) Transfer of substance or mixture (charging and discharging) at nondedicated facilities.
Manual transfer/pouring from containers.
(Maintenance) Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Clean down and maintenance of vessels and containers.
(Cleaning) Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Clean down vessels and containers.
(Bulk) Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Bulk transfers (closed systems).
(Drum/batch transfers) Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Drum/batch transfers.
- PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities.
- PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
- PROC14 Tableting, compression, extrusion, pelletisation, granulation.
- PROC15 Use as laboratory reagent.
- PROC16 Use as fuels.

Environment

- ERC2 Formulation into mixture.
- ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article).
- ERC5 Use at industrial site leading to inclusion into/onto article.
- ERC6a Use of intermediate.
- ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article).
- ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article).
- ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article).
- ERC7 Use of functional fluid at industrial site.
- ERC9a Widespread use of functional fluid (indoor).
- ERC9b Widespread use of functional fluid (outdoor).

Consumer

- PC13 Fuels.
(Automotive refueling).
(Home heating fuel).
(Garden equipment use).
(Garden equipment refueling).

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Exposure Scenario 1 – Distribution of Kerosene (petroleum) sweetened (Industrial)

1.0 Contributing scenarios	
Sector(s) of Use [SU]	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process Category [PROC]	PROC1 PROC2 PROC2 (Storage) – (Covers PROC1 storage also) PROC3 PROC3 (Sampling) PROC4 PROC8a (Maintenance) PROC8b (Bulk) PROC9 PROC15
Chemical Product Category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental Release Categories [ERC]	ERC4 ERC5 ERC6a ERC6b ERC6c ERC6d ERC7
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 1.1b.v1

2.0 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Physical form of product	Liquid
Vapour pressure	0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Human factors not influenced by risk management	
Potential exposure area	Not defined
Frequency and duration of use	
Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently)
Frequency of use (days/year)	100
Operational conditions affecting worker exposure	
Area of use	All PROCs Indoor
Characteristics of the surroundings	Not defined
General measures applicable to all activities	
Assumes use at not more than 20 °C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.	
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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.	
Technical conditions of use	
PROC1, PROC2, PROC3	Handle substance within a closed system.
PROC9	Fill containers/cans at dedicated fill points supplied with local extract ventilation (Efficiency of at least 90 %).
Organisational measures	
PROC8a (Maintenance)	Drain down system prior to equipment break-in or maintenance (Efficiency of at least 80 %).
Risk management measures related to human health	
Respiratory protection	No special measures are required.
Hand and/or Skin protection	No special measures are required.
Eye Protection	No special measures are required.

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Other operational conditions affecting worker exposure

Ensure material transfers are under containment or extract ventilation (PROC3 (Sampling) PROC8b (Bulk)). Clear lines prior to decoupling (PROC4; PROC8b (Bulk)).
 Handle in a fume cupboard or under extract ventilation (PROC15).
 Avoid splashing (PROC8b (Bulk)).
 Store substance within a closed system (PROC2 (Storage)).
 Avoid dip sampling (PROC2 (Storage)).
 Provide extract ventilation to transfer points where emissions occur (PROC4).
 Have the system examined and tested against its performance standard - generally at least every 14 months (PROC15).
 Retain drain down in sealed storage pending disposal or for subsequent recycle (PROC8a (Maintenance)). Deal with spills immediately (PROC8a (Maintenance)).
 Ensure dedicated sample points are provided (PROC2 (Storage)).

2.2 Control of environmental exposure

Amounts used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tons/year):	1.3E+06
Fraction of Regional tonnage used locally: tons/year	2.0E-03
Annual site tonnage (tons/year):	2.7E+03
Average daily use (kg/day)	2.7E+04

Environment factors not influenced by risk management

Flow rate of receiving surface water (m ³ /d):	Not defined (default = 18,000)
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	100
Release fraction to air from process (initial release prior to RMM):	1.0E-03
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-05
Release fraction to soil from process (initial release prior to RMM):	1.0E-05

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

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

Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	57.9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	0
Treat soil emission to provide a typical removal efficiency of (%):	0

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 (m ³ /d)	2.0E+03
Degradation effectiveness (%)	95.0

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

Substance release quantities after risk management measures

Release to waste water from process (mg/l)	Not defined
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	2.2E+05

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
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Process category [PROC]	Inhalation		Dermal		Combined
	Inhalation exposure (ppm)	Risk characterisation ratio (RCR)	Dermal exposure (mg/kg/d)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.01	0.00	0.00	-	0.00
PROC2	10.0	0.25	0.00	-	0.25
PROC1/2 (Storage)	10.0	0.25	0.00	-	0.25
PROC3	25.0	0.63	0.00	-	0.63
PROC3 (Sampling)	25.0	0.63	0.00	-	0.63
PROC4	20.0	0.50	0.00	-	0.50
PROC8a (Maintenance)	10.0	0.25	0.00	-	0.25
PROC8b (Bulk)	5.0	0.13	0.00	-	0.13
PROC9	5.0	0.13	0.00	-	0.13
PROC15	10.0	0.25	0.00	-	0.25

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Kerosine is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance. As the model assumes fractionation before entering the environment, the PEC is not of the substance manufactured but is a sum of the constituents expected to be present in the environmental compartment.

Environmental exposure	STP	Freshwater	Marine water	Soil	Freshwater sediment	Marine sediment
Predicted environmental exposure (PEC)	6.7E-03 mg/L	6.9E-03 mg/L	6.7E-05 mg/L	2.6E-03 mg/kg ww	7.2E-02 mg/kg ww	1.1E-03 mg/kg ww
Risk characterisation ratio (RCR)	2.4E-03	1.2E-01	1.0E-03	3.7E-04	5.3E-02	1.3E-03

Human exposure prediction:

Route of exposure	Exposure (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	1.2E+00	6.5E-05
Inhalation	7.7E-01	4.1E-05

4. Evaluation guidance to downstream user

<i>For scaling see</i>	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for other health effects. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Exposure assessment instrument/tool/method	Worker	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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Exposure Scenario 2 – Formulation and (Re)Packing of Kerosene (petroleum) sweetened (Industrial)

1.0 Contributing scenarios	
Sector of Use [SU]	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process Category [PROC]	PROC1 PROC2 PROC2 (Storage) – (Covers PROC1 storage also) PROC3 PROC3 (Sampling) PROC4 PROC5 PROC8a (Maintenance) PROC8a (Manual) PROC8b (Bulk) PROC8b (Drum/Batch transfers) PROC9 PROC14 PROC15
Chemical Product Category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental Release Categories [ERC]	ERC2
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 2.2.v1

2.0 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Human factors not influenced by risk management	
Potential exposure area	Not defined
Frequency and duration of use	
Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently)
Frequency of use (days/year)	300
Operational conditions affecting worker exposure	
Area of use	All PROCs Indoor
Characteristics of the surroundings	Not defined
General measures applicable to all activities	
Assumes use at not more than 20 °C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.	
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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.	
Technical conditions of use	
PROC1, PROC2, PROC3	Handle substance within a closed system.
Organisational measures	
PROC5, PROC8a (Manual), PROC14	Provide extract ventilation to transfer points where emissions occur (Efficiency of at least 90 %).
PROC8b (Drum/Batch transfers)	Provide extract ventilation to transfer points where emissions occur (Efficiency of at least 97 %).
Risk management measures related to human health	
Respiratory protection	No special measures are required.
Hand and/or skin protection	No special measures are required.
Eye protection	No special measures are required.
Other operational conditions affecting worker exposure	
Provide extract ventilation to transfer points where emissions occur (PROC4). Clear lines prior to decoupling (PROC4). Ensure material transfers are under containment or extract ventilation (PROC3 (Sampling)); (PROC8b (Bulk)).	

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Handle in a fume cupboard or under extract ventilation (PROC15).
 Clear lines prior to decoupling (PROC15).
 Avoid splashing (PROC15).
 Use drum pumps or carefully pour from container (PROC8a (Manual)).
 Use drum pumps (PROC8b (Drum/Batch transfers)).
 Fill containers/cans at dedicated fill points supplied with local extract ventilation (PROC9).
 Deal with spills immediately (PROC8a (Maintenance)). Store substance within a closed system (PROC2 (Storage)).
 Avoid dip sampling (PROC2 (Storage)).
 Have the system examined and tested against its performance standard - generally at least every 14 months (PROC15).
 Drain down system prior to equipment break-in or maintenance (PROC8a (Maintenance)).
 Retain drain down in sealed storage pending disposal or for subsequent recycle (PROC8a (Maintenance)).
 Ensure dedicated sample points are provided PROC2 (Storage).

2.2 Control of environmental exposure

Amounts used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	1.3E+06
Fraction of regional tonnage used locally (tonnes/year):	2.3E-02
Annual site tonnage (tonnes/year):	3.0E+04
Average daily use (kg/day)	1.0E+05

Environment factors not influenced by risk management

Flow rate of receiving surface water (m ³ /d):	Not defined (default = 18,000)
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	300
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements):	2.5E-02
Release fraction to wastewater from process (initial release prior to RMM):	2.0E-04
Release fraction to soil from process (initial release prior to RMM):	1.0E-04

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

Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	94.8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Treat soil emission to provide a typical removal efficiency of (%):	0

Common practices vary across sites thus conservative process release estimates used. Do not allow uncontrolled discharge of product into the environment. 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 (m ³ /d)	2.0E+03
Degradation effectiveness (%)	95.0

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

Substance release quantities after risk management measures

Release to waste water from process (mg/l)	Not defined
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1.0E+05

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless
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otherwise indicated.

Process category [PROC]	Inhalation		Dermal		Combined
	Inhalation exposure (ppm)	Risk characterisation ratio (RCR)	Dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.01	0.00	0.00	-	0.00
PROC2	10.0	0.25	0.00	-	0.25
PROC1/2 (Storage)	10.0	0.25	0.00	-	0.25
PROC3	25.0	0.63	0.00	-	0.63
PROC3 (Sampling)	25.0	0.63	0.00	-	0.63
PROC4	20.0	0.50	0.00	-	0.50
PROC5	5.0	0.13	0.00	-	0.13
PROC8a (Maintenance)	10.0	0.25	0.00	-	0.25
PROC8a (Manual)	5.0	0.13	0.00	-	0.13
PROC8b (Bulk)	5.0	0.13	0.00	-	0.13
PROC8b (Drum/Batch transfers)	1.50	0.04	0.00	-	0.04
PROC9	5.0	0.13	0.00	-	0.13
PROC14	5.0	0.13	0.00	-	0.13
PROC15	10.0	0.25	0.00	-	0.25

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Kerosine is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance. A PNEC is therefore not available for Kerosine for individual environmental compartments.

Environmental exposure	STP	Freshwater	Marine water	Soil	Freshwater sediment	Marine sediment
Predicted environmental exposure (PEC)	5.1E-01 mg/l	5.1E-02 mg/l	5.0E-03 mg/l	5.5E-03 mg/kg ww	8.1E-01 mg/kg ww	8.1E-02 mg/kg ww
Risk characterisation ratio (RCR)	1.8E-01	7.5E-01	7.5E-02	1.6E-02	9.7E-01	9.7E-02

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	6.3E+00	3.3E-04
Inhalation	1.6E+02	8.6E-03

4. Evaluation guidance to downstream user

For scaling see Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for other health effects. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Exposure assessment instrument/tool/method	Workers	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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Exposure Scenario 3 – Use of Kerosene (petroleum) sweetened as a fuel (Industrial)

1.0 Contributing scenarios	
Sector of Use [SU]	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process Category [PROC]	PROC2 (General exposure) – (Covers PROC1 also) PROC2 (Storage) – (Covers PROC1 storage also) PROC3 PROC8a (Maintenance) PROC8a (Cleaning) PROC8b (Bulk) PROC8b (Drum/Batch transfers) PROC16
Chemical Product Category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental Release Categories [ERC]	ERC7
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 7.12a.v1

2.0 Operational conditions and risk management measures

2.1 Control of worker exposure

Product characteristics

Physical form of product	Liquid
Vapour pressure	0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Human factors not influenced by risk management

Potential exposure area	Not defined
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Frequency and duration of use

Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently)
Frequency of use (days/year)	300

Operational conditions affecting worker exposure

Area of use	PROC8b (Bulk)	Outdoor
	All other PROCs	Indoor
Characteristics of the surroundings	Not defined	

General measures applicable to all activities

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

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

Technical conditions of use

Not defined

Organisational measures

PROC8b (Drum/Batch transfers)	Provide a good standard of general ventilation (Efficiency of at least 30 %).
PROC8a (Maintenance)	Drain down system prior to equipment break-in or maintenance (Efficiency of at least 80 %).
PROC8a (Cleaning)	Apply vessel entry procedures including use of forced supplied air (Efficiency of at least 90 %).

Risk management measures related to human health

Respiratory protection	No special measures are required.
Hand and/or Skin protection	No special measures are required.
Eye Protection	No special measures are required.

Other operational conditions affecting worker exposure

Handle substance within a closed system (PROC2 (General exposure); PROC3; PROC16).
Ensure operation is undertaken outdoors (PROC8b (Bulk)).
Ensure material transfers are under containment or extract ventilation (PROC8b (Bulk)).
Clear lines prior to decoupling (PROC8b (Bulk)).
Use drum pumps (PROC8b (Drum/Batch transfers)).
Avoid spillage when withdrawing pump (PROC8b (Drum/Batch transfers)).
Deal with spills immediately (PROC8a (Maintenance)).

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Store substance within a closed system (PROC2 (Storage)).
 Avoid dip sampling (PROC2 (Storage)).
 Ensure operatives are trained to minimise exposures (PROC8b (Bulk); PROC8b (Drum/Batch transfers)).
 Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan (PROC8b (Drum/Batch transfers)).
 Retain drain down in sealed storage pending disposal or for subsequent recycle (PROC8a (Maintenance); PROC8a (Cleaning)).
 Transfer via enclosed lines (PROC8a (Cleaning)).
 Ensure dedicated sample points are provided (PROC2 (Storage)).

2.2 Control of environmental exposure

Amounts used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	5.4E+05
Fraction of regional tonnage used locally (tonnes/year):	1.0E+00
Annual site tonnage (tonnes/year):	5.4E+05
Average daily use (kg/day)	1.8E+06

Environment factors not influenced by risk management

Flow rate of receiving surface water (m ³ /d):	Not defined (default = 18,000)
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	300
Release fraction to air from process (initial release prior to RMM):	5.0E-02
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-05
Release fraction to soil from process (initial release prior to RMM):	0

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

Risk from environmental exposure is driven by freshwater sediment.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	94.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Treat soil emission to provide a typical removal efficiency of (%):	Not defined

Common practices vary across sites thus conservative process release estimates used. 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 (m ³ /d)	2000
Degradation effectiveness (%)	95

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Substance release quantities after risk management measures

Release to waste water from process (mg/l)	Not defined
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2.1E+06

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
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	Inhalation	Dermal	General Comment Regarding All Tables
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Process category [PROC]	inhalation exposure (mg/m ³)	Risk characterisation ratio (RCR)	dermal exposure(mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1/2 (General exposure)	10.0	0.25	0.00	-	0.25
PROC1/2 (Storage)	10.0	0.25	0.00	-	0.25
PROC3	25.0	0.63	0.00	-	0.63
PROC8a (Maintenance)	10.0	0.25	0.00	-	0.25
PROC8a (Cleaning)	5.00	0.13	0.00	-	0.13
PROC8b (Bulk)	35.0	0.88	0.00	-	0.88
PROC8b (Drum/Batch transfers)	35.0	0.88	0.00	-	0.88
PROC16	5.00	0.13	0.00	-	0.13

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Kerosine is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance. PNEC is therefore not available for Kerosine for individual environmental compartments.

Environmental exposure	STP	Freshwater	Marine water	Soil	Freshwater sediment	Marine sediment
Predicted environmental exposure (PEC)	4.5E-01 mg/l	4.5E-02 mg/l	4.5E-03 mg/l	9.7E-03 mg/kg ww	7.3E-01 mg/kg ww	7.3E-02 mg/kg ww
Risk characterisation ratio (RCR)	1.6E-01	6.7E-01	6.7E-02	2.8E-02	8.6E-01	8.6E-02

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	6.5E+00	3.4E-04
Inhalation	2.9E+02	1.5E-02

4. Evaluation guidance to downstream user

For scaling see Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for other health effects. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Exposure assessment instrument/tool/method	Workers	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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Exposure Scenario 4 – Use of Kerosene (petroleum) sweetened as a fuel (Professional)

1.0 Contributing scenarios	
Sector of Use [SU]	SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process Category [PROC]	PROC2 (General exposure) PROC2 (Storage) – (Covers PROC1 storage also) PROC3 PROC8a (Maintenance) PROC8a (Cleaning) PROC8b (Bulk) PROC8b (Drum/Batch transfers) PROC16
Chemical Product Category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental Release Categories [ERC]	ERC9a ERC9b
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 9.12b.v1

2.0 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Human factors not influenced by risk management	
Potential exposure area	Not defined
Frequency and duration of use	
Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently)
Frequency of use (days/year)	365
Operational conditions affecting worker exposure	
Area of use	PROC8b (Bulk) Outdoor All other PROCs Indoor
Characteristics of the surroundings	Not defined
General measures applicable to all activities	
Assumes use at not more than 20 °C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.	
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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.	
Technical conditions of use	
Not defined	
Organisational measures	
PROC8b (Bulk)	Ensure operatives are trained to minimise exposures (Efficiency of at least 15%)
PROC8b (Drum/Batch transfers)	Provide a good standard of general ventilation (Efficiency of at least 30 %).
PROC8a (Maintenance)	Drain down system prior to equipment break-in or maintenance (Efficiency of at least 80 %).
PROC8a (Cleaning)	Apply vessel entry procedures including use of forced supplied air (Efficiency of at least 80 %).
Risk management measures related to human health	
Respiratory protection	No special measures are required.
Hand and/or skin protection	No special measures are required.
Eye protection	No special measures are required.
Other operational conditions affecting worker exposure	
Handle substance within a closed system (PROC2 (General exposure); PROC3; PROC16). Ensure operation is undertaken outdoors (PROC8b (Bulk)). Ensure material transfers are under containment or extract ventilation (PROC8b (Bulk)). Clear lines prior to decoupling (PROC8b (Bulk)).	

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Use drum pumps or carefully pour from container (PROC8b (Drum/Batch transfers)).
 Avoid spillage when withdrawing pump (PROC8b (Drum/Batch transfers)).
 Deal with spills immediately (PROC8a (Maintenance)).
 Transfer via enclosed lines (PROC8a (Cleaning)).
 Store substance within a closed system (PROC2 (Storage)).
 Avoid dip sampling (PROC2 (Storage)).
 Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan (PROC8b (Drum/Batch transfers)).
 Retain drain down in sealed storage pending disposal or for subsequent recycle (PROC8a (Maintenance); PROC8a (Cleaning)).
 Ensure dedicated sample points are provided (PROC2 (Storage)).

2.2 Control of environmental exposure

Amounts used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	7.1E+05
Fraction of regional tonnage used locally (tonnes/year):	5.0E-04
Annual site tonnage (tonnes/year):	3.6E+02
Average daily use (kg/day)	9.8E+02

Environment factors not influenced by risk management

Flow rate of receiving surface water (m³/d):	Not defined (default = 18,000)
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	365
Release fraction to air from wide dispersive use (regional use only)	1.0E-03
Release fraction to wastewater from wide dispersive use	1.0E-05
Release fraction to soil from wide dispersive use (regional use only)	0.00001

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

Risk from environmental exposure is driven by freshwater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	54.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Treat soil emission to provide a typical removal efficiency of (%):	0

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

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)	2000
Degradation effectiveness (%)	95.0

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

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

Substance release quantities after risk management measures

Release to waste water from process (mg/l)	Not defined
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	9.0E+03

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model)	ECETOC TRA
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Process category	Inhalation		Dermal		Combined
	Inhalation	Risk	Dermal	Risk	Risk characterisation ratio

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[PROC]	exposure (ppm)	characterisation ratio (RCR)	exposure (mg/kg bw/day)	characterisation ratio (RCR)	(RCR)
PROC2 (General exposure)	20.0	0.50	0.00	-	0.50
PROC1/2 (Storage)	20.0	0.50	0.00	-	0.50
PROC3	25.0	0.63	0.00	-	0.63
PROC8a (Maintenance)	20.0	0.50	0.00	-	0.50
PROC8a (Cleaning)	20.0	0.50	0.00	-	0.50
PROC8b (Bulk)	29.8	0.74	0.00	-	0.74
PROC8b (Drum/Batch transfers)	35.0	0.88	0.00	-	0.88
PROC16	10.0	0.25	0.00	-	0.25

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
 Kerosine is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance. PNEC is therefore not available for Kerosine for individual environmental compartments.

Environmental exposure	STP	Freshwater	Marine water	Soil	Freshwater sediment	Marine sediment
Predicted environmental exposure (PEC)	2.5E-04 mg/l	6.2E-03 mg/l	2.8E-05 mg/l	2.7E-03 mg/kg ww	6.2E-02 mg/kg ww	6.8E-04 mg/kg ww
Risk characterisation ratio (RCR)	8.9E-05	1.1E-01	4.9E-04	7.9E-04	4.1E-02	1.6E-04

Human exposure prediction

Route of Exposure	Exposure (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	1.2E+00	6.4E-05
Inhalation	7.1E-01	3.7E-05

4. Evaluation guidance to downstream user

For scaling see Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
 Available hazard data do not support the need for a DNEL to be established for other health effects.
 Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Exposure assessment instrument/tool/method	Worker	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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Exposure Scenario 5 – Use of Kerosene (petroleum) sweetened as a fuel (Consumer)

1.0 Contributing scenarios	
Sector of Use [SU]	SU21 Consumer uses: Private households (= general public = consumers)
Process Category [PROC]	Not applicable
Chemical Product Category [PC]	PC13 (Automotive refueling) PC13 (Home heating fuel) PC13 (Garden equipment use) PC13 (Garden equipment refueling)
Article Categories [AC]	Not applicable
Environmental Release Categories [ERC]	ERC9a ERC9b
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 9.12c.v1

2.0 Operational conditions and risk management measures													
2.1 Control of worker exposure													
Product characteristics													
Physical form of product	Liquid												
Vapour pressure	>10Pa (STP)												
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)												
Human factors not influenced by risk management													
Potential exposure area	<table border="1"> <thead> <tr> <th>Chemical Product Category [PC]</th> <th>Category</th> <th>Skin contact (cm²)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">PC13</td> <td>Automotive refueling</td> <td>210</td> </tr> <tr> <td>Home heating fuel</td> <td>210</td> </tr> <tr> <td>Garden equipment use</td> <td>-</td> </tr> <tr> <td>Garden equipment refueling</td> <td>420</td> </tr> </tbody> </table>	Chemical Product Category [PC]	Category	Skin contact (cm ²)	PC13	Automotive refueling	210	Home heating fuel	210	Garden equipment use	-	Garden equipment refueling	420
	Chemical Product Category [PC]	Category	Skin contact (cm ²)										
	PC13	Automotive refueling	210										
		Home heating fuel	210										
		Garden equipment use	-										
Garden equipment refueling		420											
Exposure duration (hours/event)	<table border="1"> <thead> <tr> <th>Chemical Product Category [PC]</th> <th>Category</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td rowspan="4">PC13</td> <td>Automotive refueling</td> <td>0.05</td> </tr> <tr> <td>Home heating fuel</td> <td>0.03</td> </tr> <tr> <td>Garden equipment use</td> <td>2.00</td> </tr> <tr> <td>Garden equipment refueling</td> <td>0.03</td> </tr> </tbody> </table>	Chemical Product Category [PC]	Category	Duration	PC13	Automotive refueling	0.05	Home heating fuel	0.03	Garden equipment use	2.00	Garden equipment refueling	0.03
	Chemical Product Category [PC]	Category	Duration										
	PC13	Automotive refueling	0.05										
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Garden equipment refueling		0.03											
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	Chemical Product Category [PC]	Category	Frequency of use										
	PC13	Automotive refueling	52										
		Home heating fuel	365										
		Garden equipment use	26										
Garden equipment refueling		26											
Amounts used (g/event)	<table border="1"> <thead> <tr> <th>Chemical Product Category [PC]</th> <th>Category</th> <th>Mass</th> </tr> </thead> <tbody> <tr> <td rowspan="4">PC13</td> <td>Automotive refueling</td> <td>50,000</td> </tr> <tr> <td>Home heating fuel</td> <td>1,500</td> </tr> <tr> <td>Garden equipment use</td> <td>1,000</td> </tr> <tr> <td>Garden equipment refueling</td> <td>1,000</td> </tr> </tbody> </table>	Chemical Product Category [PC]	Category	Mass	PC13	Automotive refueling	50,000	Home heating fuel	1,500	Garden equipment use	1,000	Garden equipment refueling	1,000
	Chemical Product Category [PC]	Category	Mass										
	PC13	Automotive refueling	50,000										
		Home heating fuel	1,500										
		Garden equipment use	1,000										
Garden equipment refueling		1,000											
Operational conditions													
Area of use	Not defined												
Characteristics of the surroundings													

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	Chemical Product Category [PC]	Category	Room size (m ³)
		PC13	Automotive refueling
		Home heating fuel	20
		Garden equipment use	100 or outdoor
		Garden equipment refueling	34
Risk management measures			
Respiratory protection	No specific measures identified.		
Hand/Skin protection	No specific measures identified.		
Eye Protection	No specific measures identified.		
2.2 Control of environmental exposure			
Amounts used			
Fraction of EU tonnage used in region:	0.1		
Regional use tonnage (tonnes/year):	7.6E+04		
Fraction of regional tonnage used locally (tonnes/year):	5.0E-04		
Annual site tonnage (tonnes/year):	3.8E+01		
Maximum daily site tonnage (kg/day):	1.0E+02		
Environment factors not influenced by risk management			
Flow rate of receiving surface water (m ³ /d):	Not defined (default = 18,000)		
Local freshwater dilution factor:	10		
Local marine water dilution factor:	100		
Operational conditions			
Emission days (days/year):	365		
Release fraction to air from wide dispersive use (regional use only):	1.0E-03		
Release fraction to wastewater from wide dispersive use:	1.0E-05		
Release fraction to soil from wide dispersive use (regional use only):	1.0E-05		
Technical conditions and measures at process level (source) to prevent release			
Not defined			
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil			
Treat air emission to provide a typical removal efficiency of (%):	0		
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	54.0		
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0		
Treat soil emission to provide a typical removal efficiency of (%):	0		
Organisational measures to prevent/limit release from site			
Not defined			
Conditions and measures related to municipal sewage treatment plant			
Size of municipal sewage system/treatment plant (m ³ /d)	2000		
Degradation effectiveness (%)	95.0		
Conditions and measures related to external treatment of waste for disposal			
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.			
Conditions and measures related to external recovery of waste			
This substance is consumed during use and no waste of the substance is generated.			
Substance release quantities after risk management measures			
Release to waste water from process (mg/l)	Not defined		
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	9.6E+02		

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model) ECETOC TRA

Yearly use (chronic):

Process Category [PROC]	Inhalation		Dermal		Combined
	Inhalation exposure (mg/m ³)	Risk characterisation ratio (RCR)	Dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC13 (Automotive refueling)	0.29	0.01	0.50	0.00	0.01
PROC13 (Home heating fuel)	2.04	0.05	3.50	0.00	0.05

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PROC13 (Garden equipment use)	0.68	0.02	0.00	0.00	0.02
PROC13 (Garden equipment refueling)	0.08	0.00	0.49	0.00	0.00

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) | The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
 Kerosene is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance. PNEC is therefore not available for Kerosene for individual environmental compartments.

Environmental exposure	STP	Freshwater	Marine water	Soil	Freshwater sediment	Marine sediment
Predicted environmental exposure (PEC)	2.6E-05 mg/l	6.2E-03 mg/l	2.5E-05 mg/l	2.6E-03 mg/kg ww	6.1E-02 mg/kg ww	6.5E-04 mg/kg ww
Risk characterisation ratio (RCR)	9.5E-06	1.1E-01	4.6E-04	4.1E-04	4.0E-02	1.2E-04

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	1.2E+00	6.4E-05
Inhalation	7.1E-01	3.7E-05

4. Evaluation guidance to downstream user

<i>For scaling see</i>	Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Exposure assessment instrument/tool/method	Worker	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.