Safety Data Sheet

According to regulations in the United Kingdom of Great Britain & Northern Ireland

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

1.1. Product identifier

Substance name: **Kerosene**

Code: 815841

MARPOL Annex I Category: Kerosenes

UK REACH Registration Number: UK-01-5382718756-7-0017

Index Number: 649-404-00-4

Issue date: 29-Jun-2022

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

Relevant identified uses: Fuel

Uses advised against: Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
UK

Customer Service: +44 (0)1469 571572

SDS Information: URL: www.Phillips66.com/SDS
Email: SDS@P66.com

1.4. Emergency telephone number CHEMTREC Global +1 703 527 3887
CHEMTREC UK +(44)-870-8200418

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

H226 -- Flammable liquids -- Category 3
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H336 -- Specific target organ toxicity (single exposure) -- Category 3 (Central Nervous System (CNS))
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

2.2. Label elements

DANGER

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
P102 - Keep out of reach of children
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P273 - Avoid release to the environment
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

2.3. Other hazards

Electrostatic charge may be generated during pumping and other operations
Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) substances.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance	Concentration[1]	EINECS	REACH Reg. No
Kerosine, petroleum 8008-20-6	100	232-366-4	UK-01-5382718756-7

Substance	Classification[2]	M-Factor/ATE/SCL
Kerosine, petroleum 8008-20-6	Flam. Liq. 3, H226 Asp. Tox. 1, H304 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Chronic 2, H411	

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
See Section 11 for more information.
Full text of H-Statements referred to under section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed

While significant vapour concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting. Prolonged or repeated contact may dry skin and cause irritation

4.3. Indication of any immediate medical attention and special treatment needed

Other Comments None

SECTION 5: Firefighting measures

5.1. Extinguishing media

Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

5.2. Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapours may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapour/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapours are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulphur may also be formed.

5.3. Special protective actions for fire-fighters

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapours and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorised personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

6.2. Environmental precautions

Stop and contain spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorised drainage systems, and natural waterways. Use foam on spills to minimise vapours Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3. Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Flammable. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). May vaporize easily at ambient temperatures. The vapour is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulphur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

7.2. Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to appropriate guidance pertaining to cleaning, repairing, welding, or other contemplated operations. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

7.3. Specific end use(s)

Refer to supplemental exposure scenarios if attached.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits:

Substance	ACGIH	Ireland	United Kingdom	Phillips 66
Kerosine, petroleum	TWA-8hr: 200 mg/m^3 total hydrocarbon vapor Kerosene/Jet fuels Skin	Skin	---	TWA-8hr: 200 mg/m^3 TWA-8hr: 28 ppm Skin

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); None = No Occupational Exposure Limit. Local regulations may be more stringent than regional or national requirements.

Biological Limit Values: None

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)
Inhalation: Not applicable
Dermal: Not applicable

Consumer Derived No-Effect Level (DNEL)
Inhalation: Not applicable
Dermal: Not applicable
Ingestion: 18.8 mg/kgbw/day

Environmental Predicted No-Effect Concentration (PNEC): Not applicable

8.2. Exposure controls

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds EN 166 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, close fitting eye protection and a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled that comply with EN 374 is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile rubber

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit an approved air purifying respirator equipped with Type A, organic gases and vapour filters (as specified by the manufacturer) may be used.

A respiratory protection programme that follows recommendations for the selection, use, care and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Environmental Exposure Controls: Refer to Sections 6, 7, 12 and 13.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Physical State:	Liquid
Colour:	Colourless
Odour:	Kerosene
Melting / freezing point:	< -52.6 °F / < -47 °C
Initial boiling point and boiling range:	284 - 572 °F / 140 - 300 °C
Flammability (solid, gas):	N/A
Upper Explosive Limits (vol % in air):	6.0
Lower Explosive Limits (vol % in air):	0.5

Flash point:	> 100.4 °F / > 38 °C
Method:	(estimate)
Autoignition temperature:	482 °F / 250 °C
Decomposition temperature:	N/D
pH:	N/A
Viscosity:	1.3-2.9 mm²/s @ 20°C
Solubility:	Insoluble in water
Partition coefficient n-octanol /water (log Kow):	N/D
Vapour pressure:	3 kPa @ 20°C
Vapour density:	>1
Relative density:	0.77-0.82 @ 15°C
Particle characteristics:	N/A

9.2. Other information

9.2.1. Information with regards to physical hazard classes

No information available

9.2.2. Other safety characteristics

Evaporation Rate (nBuAc=1):	N/D
Bulk Density:	N/D
Pour point:	< -52.6 °F / < -47 °C
Explosive properties:	N/D
Oxidising properties:	N/D

SECTION 10: Stability and reactivity

10.1. Reactivity	Not chemically reactive.
10.2. Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3. Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4. Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapour accumulation.
10.5. Incompatible materials	Avoid contact with strong oxidizing agents and strong reducing agents.
10.6. Hazardous decomposition products	Not anticipated under normal conditions of use.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Likely Routes of Exposure: Inhalation, Ingestion, Eye contact, Skin contact
Aspiration Hazard: May be fatal if swallowed and enters airways.

Acute Oral Toxicity

Product

Classification: Unlikely to be harmful
Oral LD50: >5 g/kg (rat)

Substance	Oral LD50	Species	Method	Remarks
Kerosine, petroleum	> 5 g/kg	Rat	Other: EPA OTS 798.1175 (Acute Oral Toxicity)	Based on similar material

Acute Dermal Toxicity

Product

Classification: Unlikely to be harmful
Dermal LD50: >2 g/kg (rabbit)

Substance	Dermal LD50	Species	Method	Remarks
Kerosine, petroleum	> 2 g/kg	Rabbit	Other: EPA OTS 798.1100 (Acute	Based on similar material

			Dermal Toxicity)	

Acute Inhalation Toxicity

Product

Classification: Unlikely to be harmful
Inhalation LC50 : >5.28 mg/L (mist) (rat)

Substance	Inhalation LC50	Species	Method	Remarks
Kerosine, petroleum	> 5.28 mg/L	Rat	Similar to OECD 403	Mist

Serious Eye Damage/Irritation

Product

Classification: Causes mild eye irritation

Substance	Classification	SCL	Species	Method	Remarks
Kerosine, petroleum	Causes mild eye irritation.		Rabbit	Other: EPA OTS 798.4500 (Acute Eye Irritation)	Based on similar material

Skin Corrosion/Irritation

Product

Classification: Causes skin irritation
Additional Information: Repeated exposure may cause skin dryness or cracking

Substance	Classification	SCL	Species	Method	Remarks
Kerosine, petroleum	Causes skin irritation		Rabbit	Other: EPA Guidelines in FR Vol. 44, No. 145	

Respiratory Sensitisation

Product

Classification: No information available

Substance	Respiratory Sensitisation:	SCL	Species	Method	Remarks
Kerosine, petroleum	No information available				

Skin Sensitisation

Product

Classification: Not expected to be a skin sensitizer

Substance	Skin Sensitisation	SCL	Species	Method	Remarks
Kerosine, petroleum	Not expected to be a skin sensitizer		Guinea pig	Other: EPA OTS 798.4100 (Skin Sensitisation)	Based on similar material

Specific target organ toxicity - Single exposure

Product

Classification: May cause drowsiness and dizziness

Substance	Specific target organ toxicity - Single exposure	Target Organs
Kerosine, petroleum	May cause drowsiness and dizziness.	

Specific target organ toxicity - Repeated exposure

Product

Classification: Not expected to cause organ effects from repeated exposure

Substance	Specific target organ toxicity - Repeated exposure	SCL	Method	Target Organs
Kerosine, petroleum	Not expected to cause organ effects from repeated exposure		Similar to OECD 408 OECD 411 OECD 413	

Carcinogenicity

Product

Classification: Not expected to cause cancer

Substance	Classification	Method
Kerosine, petroleum	Not expected to cause cancer.	Similar to OECD 451

Reproductive/Developmental/Teratogenic effects

Product

Classification: Not expected to cause reproductive toxicity

Kerosine, petroleum (8008-20-6)			
Endpoint type	**Method**	**Result**	**Remarks**
Effects on fertility	Similar to OECD 415	Based on available data, the classification criteria are not met	
Effects on fetal development	OECD 414	Based on available data, the classification criteria are not met	

Additional Information

Kerosine, petroleum

Hydrodesulphurized kerosene applied to the skin of female rats at 494, 330, or 165 mg/kg daily for 7 consecutive weeks (premating, mating, and gestation), or for 8 consecutive weeks in males did not result in systemic, reproductive, or developmental toxicity.

Mutagenic effects

Product

Classification: Not expected to cause heritable genetic effects

Kerosine, petroleum (8008-20-6)		
Method	**Result**	**Remarks**
Similar to OECD 476	Negative	Based on similar material
Similar to OECD 479	Negative	Based on similar material
Similar to OECD 471	Negative	

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

The currently available information does not indicate that this substance has endocrine disrupting properties as defined by the criteria set out in Section B of Regulation (EU) No 2017/2100.

11.2.2 Other Information

None known

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity studies on samples of jet fuel and kerosine streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon

composition. Kerosines should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

12.2. Persistence and degradability

The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

12.3. Bioaccumulative potential

Hydrocarbon constituents of kerosine show measured or predicted Log Kow values ranging from 3 to 6 and above and therefore would be regarded as having the potential to bioaccumulate. In practise, metabolic processes may reduce bioconcentration.

12.4. Mobility in soil

On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilisation to air. It is possible that some of the higher molecular weight hydrocarbons will be adsorbed on sediment. Biodegradation in water is a minor loss process. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 0.1 to 0.7 days.

12.5. Results of PBT and vPvB assessment

Not a PBT or vPvB substance.

12.6 Endocrine disrupting properties

The currently available information does not indicate that this substance has endocrine disrupting properties as defined by the criteria set out in Section B of Regulation (EU) No 2017/2100.

12.7 Other adverse effects

None anticipated.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

European Waste Code: 13 07 03* other fuels (including mixtures)

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 2008/98/EC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.
This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and it's contaminants in order to assign the proper waste disposal code.
Disposal must be in accordance with Directive 2008/98/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.
Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

SECTION 14: Transport information

14.1. UN number

UN1223

14.2. UN proper shipping name

Kerosene,

14.3. Transport hazard class(es)

3

14.4. Packing group

III

14.5. Environmental hazards

Marine pollutant - Environmentally Hazardous

14.6. Special precautions for user

If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable

SECTION 15: Regulatory information

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

EC 1272/2008 - Classification, labelling and packaging of substances and mixtures
EN166:2002 Eye Protection
EN 529:2005 Respiratory Protective devices
BS EN 374-1:2016 Protective gloves against chemicals and micro-organisms
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 2008/98/EC (Waste Framework Directive)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste
Export Rating: NLR (No Licence Required)

15.2. Chemical safety assessment

A chemical safety assessment has been carried out for the substance/mixture.

SECTION 16: Other information

Issue date	29-Jun-2022
Status:	FINAL
Previous Issue Date:	07-May-2021
Revised Sections or Basis for Revision:	Format change Toxicological (Section 11)
SDS Number:	**815841**
Language:	BE

List of Relevant 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

Regulatory Basis of Classification

Classification	Regulatory Basis
H226 -- Flammable liquids -- Category 3	Based on component information.
H304 -- Aspiration Hazard -- Category 1	Based on component information.
H315 -- Skin corrosion/irritation -- Category 2	Based on component information.
H336 -- Specific target organ toxicity (single exposure) -- Category 3 (Central Nervous System (CNS))	Based on component information.
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2	Based on component information.

Key literature references and sources for data:

Information used includes one or more of the following: results from internal company data, supplier toxicology studies, CONCAWE Product Dossiers and other publicly available resources.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organisation / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Irland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Programme; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

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1. Manufacture of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Manufacture of substance
Use Descriptor	
Process category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental release category(ies)	1
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance. Includes material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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.
General exposures (closed systems)	No other specific measures identified
General exposures (open systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified

Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.

2.2 Control of environmental exposure	
Product characteristics Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.9E+06
Fraction of regional tonnage used locally	9.2E-01
Annual site tonnage (tonnes/year)	1.8E+06
Maximum daily site tonnage (kg/day)	5.9E+06
Frequency and duration of use Continuous release.	
Emission days (days/year)	300

Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
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)	5.4E-05
Release fraction to soil from process (initial release prior to RMM)	0.0001
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. Prevent discharge of undissolved substance to or recover from onsite wastewater. Onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	9.0E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	98.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	62.6
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98.2
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	5.9E+06
Assumed domestic sewage treatment plant flow (m^3/d):	1.0E+04
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.	
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – "Site-Specific Production" worksheet.	
Maximum Risk Characterisation Ratios for air emissions	1.6E-01
Maximum Risk Characterisation Ratios for wastewater emissions	9.1E-01

2. Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use as an intermediate
Use Descriptor	
Sector(s) of use	8, 9
Process category(ies)	1, 2, 3, 4, 8a, 8b, 15

Environmental release category(ies)	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate. Includes material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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.
General exposures (closed systems)	No other specific measures identified
General exposures (open systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified

Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.

2.2 Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.7E+05
Fraction of regional tonnage used locally	5.5E-02
Annual site tonnage (tonnes/year)	1.5E+04
Maximum daily site tonnage (kg/day)	5.0E+04

Frequency and duration of use
Continuous release.

Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E-02
Release fraction to wastewater from process (initial release prior to RMM)	3.0E-04
Release fraction to soil from process (initial release prior to RMM)	0.001

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. 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 (%):	8.0E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal	81.4

efficiency >= (%):	
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	7.9E+04
Assumed domestic sewage treatment plant flow (m³/d):	2.0E+03
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.	
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).	
Maximum Risk Characterisation Ratios for air emissions	6.1E-04
Maximum Risk Characterisation Ratios for wastewater emissions	6.3E-01

3. Distribution of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Distribution of substance
Use Descriptor	
Process category(ies)	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental release category(ies)	1, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
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, and associated laboratory activities. Excludes emissions during transport.	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating**

	Conditions
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.
General exposures (closed systems)	No other specific measures identified
General exposures (open systems)	No other specific measures identified
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified
Bulk transfers	No other specific measures identified
Drum and small package filling	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified

Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.

2.2 Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.4E+06
Fraction of regional tonnage used locally	2.0E-03
Annual site tonnage (tonnes/year)	4.8E+03
Maximum daily site tonnage (kg/day)	4.8E+04

Frequency and duration of use
Continuous release.

Emission days (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
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)	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. No wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	9.0E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0.0

Organisation measures to prevent/limit release from site
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.4E+06
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03

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
During manufacturing no waste of the substance is generated.

Section 3 Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).

Maximum Risk Characterisation Ratios for air emissions	3.2E-04
Maximum Risk Characterisation Ratios for wastewater emissions	2.0E-02

4. Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Formulation & (re)packing of substances and mixtures
Use Descriptor	
Process category(ies)	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental release category(ies)	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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.
General exposures (closed systems)	No other specific measures identified
General exposures (open systems)	No other specific measures identified
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified
Bulk transfers	No other specific measures identified
Mixing operations (open systems)	No other specific measures identified
Manual Transfer from/pouring from containers	No other specific measures identified
Drum/batch transfers	No other specific measures identified

Production or preparation or articles by tabletting, compression, extrusion or pelletisation	No other specific measures identified
Drum and small package filling	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified

Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.

2.2 Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.1E+06
Fraction of regional tonnage used locally	1.4E-02
Annual site tonnage (tonnes/year)	3.0E+04
Maximum daily site tonnage (kg/day)	1.0E+05

Frequency and duration of use
Continuous release.

Emission days (days/year)	300

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	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)	0.0001

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. 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 (%):	0.0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	94.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0.0

Organisation measures to prevent/limit release from site
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.2E+05
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03

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.

Section 3 Exposure Estimation

3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Section 4 Guidance to check compliance with the Exposure Scenario

4.1 Health
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).

Maximum Risk Characterisation Ratios for air emissions	1.3E-02
Maximum Risk Characterisation Ratios for wastewater emissions	8.4E-01

5. Use of substance in Cleaning Agents - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use in cleaning agents
Use Descriptor	
Process category(ies)	1, 2, 3, 4, 7, 8a, 8b, 10, 13
Environmental release category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.4a.v1
Processes, tasks, activities covered	
Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying
General exposures (closed systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Automated process with (semi) closed systems Use in contained systems	No other specific measures identified
Automated process with (semi) closed systems Use in contained systems Drum/batch transfers	No other specific measures identified
Application of cleaning products in closed systems	No other specific measures identified
Filling / preparation of equipment from drums or containers	No other specific measures identified
Use in contained batch processes Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified
Dipping, immersion and pouring	No other specific measures identified
Cleaning with low-pressure washers	No other specific measures identified
Cleaning with high pressure washers	No other specific measures identified
Manual Cleaning Surfaces no spraying	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified

Storage Product sampling	No other specific measures identified
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product characteristics Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	3.8E+00
Fraction of regional tonnage used locally	1.0E+00
Annual site tonnage (tonnes/year)	3.8E+00
Maximum daily site tonnage (kg/day)	1.9E+02
Frequency and duration of use Continuous release.	
Emission days (days/year)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E+00
Release fraction to wastewater from process (initial release prior to RMM)	3.0E-06
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. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	7.0E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0.0
Organisation 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 Not applicable as there is no release to wastewater	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.3E+04
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03
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.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.	
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).	
Maximum Risk Characterisation Ratios for air emissions	3.3E-04
Maximum Risk Characterisation Ratios for wastewater emissions	5.6E-03

6. Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use as a fuel
Use Descriptor	
Process category(ies)	1, 2, 3, 8a, 8b, 16
Environmental release category(ies)	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel or in fuels (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying
General exposures (closed systems)	No other specific measures identified
Use as a fuel (closed systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Bulk transfers	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	

2.2 Control of environmental exposure	
Product characteristics Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	3.7E+05
Fraction of regional tonnage used locally	1.0E+00
Annual site tonnage (tonnes/year)	3.7E+05
Maximum daily site tonnage (kg/day)	1.2E+06

Frequency and duration of use Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
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 (%):	9.5E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	90.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0.0
Organisation 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 Not applicable as there is no release to wastewater	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.4E+06
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03
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.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.	
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).	
Maximum Risk Characterisation Ratios for air emissions	1.7E-02
Maximum Risk Characterisation Ratios for wastewater emissions	5.2E-01

7. Use of substance as a Fuel - Professional

Section 1 Exposure Scenario Kerosenes	
Title	Use as a fuel

Use Descriptor	
Process category(ies)	1, 2, 3, 8a, 8b, 16
Environmental release category(ies)	9a, 6a
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel or in fuels (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 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).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios / Product Category	**Specific Risk Management Measures & Operating Conditions**
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. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying
General exposures (closed systems)	No other specific measures identified
Use as a fuel (closed systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Transfer from/pouring from containers	No other specific measures identified
Equipment cleaning and maintenance	No other specific measures identified
Bulk product storage	No other specific measures identified
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	

2.2 Control of environmental exposure	
Product characteristics Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	8.0e2
Fraction of regional tonnage used locally	1
Frequency and duration of use Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
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)	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. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0.0
Organisation 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 Not applicable as there is no release to wastewater	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.5E+05
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment. Combustion emissions limited by required exhaust emission controls. 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.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data does not enable the derivation of a DNEL for dermal irritant effects. Risk management measures are based on qualitative risk characterization. Available hazard data does 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.	
4.2 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 (https://cefic.org/app/uploads/2019/01/SPERCs-Specific-Envirnonmental-Release-Classes-REACHImpl-ES-CSA-CSR.pdf).	
Maximum Risk Characterisation Ratios for air emissions	6.2E-04
Maximum Risk Characterisation Ratios for wastewater emissions	6.4E-03

8. Use of substance as a Fuel - Consumer

Section 1 Exposure Scenario Kerosenes	
Title	Use as a fuel
Use Descriptor	
Product category(ies)	13
Environmental release category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	For each use event, covers use amounts up to (g): 5000. Covers skin contact area up to (cm2): 420.

Frequency and duration of use	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2
Other operational conditions affecting exposure	Covers use at ambient temperatures. assumes use in a 20 m3 room. assumes use with typical ventilation.

Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
PC13 - Fuels Liquid: Automotive Refuelling	Covers concentrations up to (%): 100. Covers use up to (times/day of use): 52. Covers skin contact area up to (cm2): 210.00. For each use event, covers use amounts up to (g): 50000. Covers use in room size of (m^3): 100. Covers exposure up to (hours/event): 0.05. No specific risk management measure identified beyond those operational conditions stated
PC13 - Fuels Liquid: home space heater fuel	Covers concentrations up to (%): 100. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm2): 210.00. For each use event, covers use amounts up to (g): 50000. Covers use under typical household ventilation Covers use in room size of (m^3): 100. Covers exposure up to (hours/event): 0.05. No specific risk management measure identified beyond those operational conditions stated
PC13 - Fuels Liquid Garden Equipment - Use	Covers concentrations up to (%): 100. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 1000. Covers outdoor use Covers use in room size of (m^3): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated
PC13 - Fuels Liquid: garden equipment - refuelling	Covers concentrations up to (%): 100. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm2): 420.00. For each use event, covers use amounts up to (g): 1000. Covers use in a one car garage (34 m^3) under typical ventilation. Covers use in room size of (m^3): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated

Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.

2.2 Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

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	5.0E-04
Annual site tonnage (tonnes/year)	3.8E+01
Maximum daily site tonnage (kg/day)	1.0E+02

Frequency and duration of use
Continuous release.

Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only)	1.0E-03
Release fraction to wastewater from wide dispersive use	1.0E-05
Release fraction to soil from wide dispersive use (regional only)	0.00001
Conditions and measures related to municipal sewage treatment plant	

Not applicable as there is no release to wastewater	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.8E+04
Assumed domestic sewage treatment plant flow (m^3/d):	2.0E+03
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.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 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.	
Maximum Risk Characterisation Ratios for air emissions	6.1E-05
Maximum Risk Characterisation Ratios for wastewater emissions	5.6E-03