Safety Data Sheet

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

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

1.1. Product identifier

Substance name: **Fuels, diesel**

Other means of identification Auto Diesel Oil (ADO); Ultra Low Sulphur Diesel (ULSD); Distillates (petroleum), hydrotreated middle; Finished Gas Oil (FGO); Heating Oil

Safety Data Sheet Number: **814603**

MARPOL Annex I Category Gas Oils, Including Ship's Bunkers

REACH Registration Number: 01-2119484664-27-0006

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

Relevant identified uses Transportation Fuel
Heating Oil

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 Irving Oil Whitegate Refinery Limited
Whitegate, Midleton, Co. Cork, Ireland

SDS Information Email: esds@irvingoil.com

1.4. Emergency telephone number

+ 353 21 4622 200

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

CLP Classification (EC No 1272/2008)
H226 - Flammable liquids -- Category 3
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H332 -- Acute toxicity, Inhalation -- Category 4
H351 -- Carcinogenicity -- Category 2
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

2.2. Label elements

DANGER

Flammable liquid and vapour
May be fatal if swallowed and enters airways
Causes skin irritation
Harmful if inhaled
Suspected of causing cancer
May cause damage to organs through prolonged or repeated exposure

Toxic to aquatic life with long lasting effects

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P260 - Do not breathe dust/fume/gas/mist/vapours/spray
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

3.2. Mixtures

Chemical Name	CASRN	EINECS	REACH Registration No.	Concentration[1]	Classification[2]
Fuels, diesel	68334-30-5	269-822-7	01-2119484664-27	90-100	H226,H304,H315,H332,H351, H373,H411
Fatty acids, C14-18 and C16-18-unsaturated, methyl esters	67762-26-9	267-007-0	01-2119471662-36	0-10	-
Fatty acids, C16-18 and C18-unsaturated, methyl esters	67762-38-3	267-015-4	01-2119471664-32	0-10	-
Naphthalene	91-20-3	202-049-5	Not applicable	<1	H351,H302,H410

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
[2] Regulation EC 1272/2008.

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. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. 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

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to the hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

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. Keep all sources of ignition away from spill/release. 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

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Do not breathe vapour or mist. Use only outdoors or in a well-ventilated area. 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. 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. 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). 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.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

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.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

Diesel engine exhaust contains hazardous combustion products and has been identified as a cancer hazard. Exposure should be minimized to reduce potential risk.

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 area away from heat 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		
Chemical Name	**ACGIH**	**Ireland**
Fuels, diesel	TWA: 100 mg/m^3 inhalable fraction and vapor	TWA: 100 mg/m^3 STEL: 300 mg/m^3

	Skin	
Naphthalene	TWA: 10 ppm Skin	TWA: 10 ppm TWA: 50 mg/m³ STEL: 15 ppm STEL: 75 mg/m³

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values		
Chemical Name	**ACGIH**	**European Union**
Naphthalene	1-Naphthol with hydrolysis plus 2-Naphthol with hydrolysis in : , end of shift (nonquantitative, nonspecific)	---

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)
Inhalation: 68.3 mg/m³
Dermal: 2.9 mg/kgbw/day

Consumer Derived No-Effect Level (DNEL)
Inhalation: 20 mg/m³
Dermal: 1.3 mg/kgbw/day
Ingestion: Not applicable

Environmental Predicted No-Effect Concentration (PNEC): No information available

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

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

Appearance:	Clear red or yellow brown
Physical Form:	Liquid

Odour:	Pungent Petroleum
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	N/D
Initial Boiling Point/Range:	180 - 390 °C
Flash Point:	> 60 °C; (Closed Cup)
Evaporation Rate (nBuAc=1):	N/D
Flammability (solid, gas):	Combustible
Upper Explosive Limits (vol % in air):	5.0
Lower Explosive Limits (vol % in air):	0.5
Vapour Pressure:	<0.1 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.82-0.88 @ 15°C
Solubility (ies):	Insoluble in water
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	250 °C
Decomposition Temperature:	N/D
Viscosity:	4.8 mm²/s @ 20°C; 1.5-5.5 mm²/s @ 40°C
Explosive Properties:	N/D
Oxidising Properties:	N/D

9.2. Other information

Pour Point: -24 °C

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 all possible sources of ignition.

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 toxicological effects

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled		> 4.1 mg/L (mist) (rat)
Dermal	Unlikely to be harmful		>2 g/kg (rabbit)
Oral	Unlikely to be harmful		> 5 g/kg (rat)

Aspiration Hazard: May be fatal if swallowed and enters airways

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitisation: Not expected to be a skin sensitizer.

Respiratory Sensitisation: No information available on the mixture, however none of the components have been classified for respiratory sensitisation (or are below the concentration threshold for classification).

Specific Target Organ Toxicity (Single Exposure): Not expected to cause organ effects from single exposure.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure. Repeated dermal application of petroleum gas oils for 90 days resulted in decreased liver, thymus, and spleen weights, and altered bone marrow function. Microscopic alterations included liver hypertrophy and necrosis, decreased hematopoesis and lymphocyte depletion.

Carcinogenicity: Suspected of causing cancer. Repeated application of residual aromatic extracts to mouse skin resulted in an increased incidence of skin tumours. They have been identified as a carcinogen by IARC.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: No information available on the mixture, however none of the components have been classified for reproductive toxicity (or are below the concentration threshold for classification).

Other Comments: Diesel engine exhaust has been classified by the International Agency for Research on Cancer (IARC) and National Toxicology Programme (NTP) as a carcinogen.

11.2 Information on Hazardous Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Programme (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

SECTION 12: Ecological information

12.1. Toxicity

Experimental studies of gas oils show that acute aquatic toxicity values are typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. They 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

Gas oils are complex combinations of individual hydrocarbon species. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable. Some hydrocarbon constituents of gas oils are predicted to meet the criteria for persistence; on the other hand, some components can be easily degraded by microorganisms under aerobic conditions.

Persistence per IOPC Fund definition: Non-Persistent

12.3. Bioaccumulative potential

Gas oil components have measured or calculated Log Kow values in the range of 3.9 to 6 which indicates a high potential to bioaccumulate. Lower molecular weight compounds are readily metabolized and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

12.4. Mobility in soil

Releases to water will result in a hydrocarbon film floating and spreading on the surface. For the lighter components, volatilisation is an important loss process and reduces the hazard to aquatic organisms. In air, the hydrocarbon vapours react readily with hydroxyl radicals with half-lives of less than one day. Photoxidation on the water surface is also a significant loss process particularly for polycyclic aromatic compounds. In water, the majority of components will be adsorbed on sediment. Adsorption is the most predominant physical process on release to soil. Adsorbed hydrocarbons will slowly degrade in both water and soil.

12.5. Results of PBT and vPvB assessment

Not a PBT or vPvB substance.

12.6. Other adverse effects

None anticipated.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

European Waste Code: 13 07 01* fuel oil and diesel

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	UN1202
14.2. UN proper shipping name	DIESEL FUEL *or* GASOIL *or* HEATING OIL, LIGHT
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. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	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 374-1:2003 Protective gloves against chemicals and micro-organisms
Occupational Exposure Limits, Health and Safety Authority
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:	09-Sep-2016
Status:	FINAL
Previous Issue Date:	18-Feb-2014
Revised Sections or Basis for Revision:	New SDS
Safety Data Sheet Number:	**814603**
Language:	BE

List of Relevant Hazard Statements:
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H332 - Harmful if inhaled
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects
H302 - Harmful if swallowed
H410 - Very toxic to aquatic life with long lasting effects
EUH066 - Repeated exposure may cause skin dryness or cracking

Regulatory Basis of Classification

CLP Classification (EC No 1272/2008)	Regulatory Basis
H226 - Flammable liquids -- Category 3	Based on test data
H304 -- Aspiration Hazard -- Category 1	Based on test data
H315 -- Skin corrosion/irritation -- Category 2	Based on component information.
H332 -- Acute toxicity, Inhalation -- Category 4	Based on component information.
H351 -- Carcinogenicity -- Category 2	Based on component information.
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2	Based on component information.
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2	Based on component information.

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

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Exposure Scenario Annex

Gas Oils (vacuum, hydrocracked & distillate fuels) (R38, R45)

1 Manufacture of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Manufacture of substance
Use Descriptor	
Sector(s) of use	3, 8, 9
Process category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental release category(ies)	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling 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	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)	5.4e6
Fraction of regional tonnage used locally	0.11
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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4
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 (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	56.1
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.0e6
Assumed domestic sewage treatment plant flow (m^3/d):	10000
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 (http://cefic.org/en/reach-for-industries-libraries.html) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet	

2 Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use as an intermediate
Use Descriptor	
Sector(s) of use	3, 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 (not related to Strictly Controlled Conditions). Includes recycling/recovery, 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)	1.8e5
Fraction of regional tonnage used locally	8.3e-2
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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4
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 (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	81.4
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.8e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
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 (http://cefic.org/en/reach-for-industries-libraries.html)	

3 Distribution of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Distribution of substance
Use Descriptor	
Sector(s) of use	3
Process category(ies)	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental release category(ies)	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
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 distribution 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
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)	5.4e6
Fraction of regional tonnage used locally	2.0e-3
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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-5
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 (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.6e6
Assumed domestic sewage treatment plant flow (m^3/d):	2000
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 (http://cefic.org/en/reach-for-industries-libraries.html)

4 Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Formulation & (re)packing of substances and mixtures
Use Descriptor	
Sector(s) of use	3, 10
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)	5.2e6
Fraction of regional tonnage used locally	5.8e-3
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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-4
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
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	86.0
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.6e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
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 (http://cefic.org/en/reach-for-industries-libraries.html)	

5 Use of substance in Metal working fluids / rolling oils - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Metal working fluids/rolling oils
Use Descriptor	

Sector(s) of use	3
Process category(ies)	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17
Environmental release category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils	
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
General exposures (open systems)	No other specific measures identified
Bulk transfers	No other specific measures identified
Filling / preparation of equipment from drums or containers	No other specific measures identified
Process sampling	No other specific measures identified
Metal machining operations	No other specific measures identified
Treatment by dipping and pouring	No other specific measures identified
Spraying	No other specific measures identified
Manual Roller, spreader, flow application	No other specific measures identified
Automated metal rolling/forming	No other specific measures identified
Semi-automated metal rolling/forming	No other specific measures identified
Equipment cleaning and maintenance Dedicated facility	No other specific measures identified
Equipment cleaning and maintenance Non-dedicated facility	No other specific measures identified
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)	5.5e2
Fraction of regional tonnage used locally	0.18
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 given operational conditions affecting environmental exposure	

Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
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 (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.9e5
Assumed domestic sewage treatment plant flow (m^3/d):	2000
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 (http://cefic.org/en/reach-for-industries-libraries.html)	

6 Use of substance in Metal working fluids / rolling oils - Professional

Section 1 Exposure Scenario Kerosenes	
Title	Metal working fluids/rolling oils
Use Descriptor	
Sector(s) of use	3
Process category(ies)	1, 2, 3, 5, 8a, 8b, 9, 10, 11, 13, 17
Environmental release category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.7c.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/reject articles, and disposal of waste oils	
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
Filling / preparation of equipment from drums or containers Dedicated facility	No other specific measures identified
Filling / preparation of equipment from drums or containers Non-dedicated facility	No other specific measures identified
Process sampling	No other specific measures identified
Metal machining operations	No other specific measures identified
Manual Roller, spreader, flow application	No other specific measures identified
Spraying	No other specific measures identified
Equipment cleaning and maintenance Dedicated facility	No other specific measures identified
Equipment cleaning and maintenance Non-dedicated facility	No other specific measures identified
Treatment by dipping and pouring	No other specific measures identified
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)	5.5e2
Fraction of regional tonnage used locally	5.0e-4

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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.15
Release fraction to wastewater from process (initial release prior to RMM)	0.05
Release fraction to soil from process (initial release prior to RMM)	0.05

Technical conditions and measures at process level (source) to prevent release
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
If discharging to domestic sewage treatment plant, provide the required onsite wastewater	0

removal efficiency of >= (%):	
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	90
Assumed domestic sewage treatment plant flow (m^3/d):	2000
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 (http://cefic.org/en/reach-for-industries-libraries.html)	

7 Use of substance as Release agents or binders - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use as binders and release agents
Use Descriptor	
Sector(s) of use	3
Process category(ies)	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14
Environmental release category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mold forming and casting, 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
Bulk transfers	No other specific measures identified
Drum/batch transfers	No other specific measures identified
Mixing operations (closed systems)	No other specific measures identified
Mixing operations (open systems)	No other specific measures identified
Mould forming	No other specific measures identified
Casting operations	No other specific measures identified
Machine Spraying	No other specific measures identified
Manual Spraying	No other specific measures identified
Manual Rolling, Brushing	No other specific measures identified
Dipping, immersion and pouring	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)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-6
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 (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.1e6
Assumed domestic sewage treatment plant flow (m^3/d):	2000

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 (http://cefic.org/en/reach-for-industries-libraries.html)

8 Use of substance as Release agents or binders - Professional

Section 1 Exposure Scenario Kerosenes	
Title	Use as binders and release agents
Use Descriptor	
Sector(s) of use	22
Process category(ies)	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14
Environmental release category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.10b.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 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
Bulk transfers	No other specific measures identified
Drum/batch transfers	No other specific measures identified
Mixing operations (closed systems)	No other specific measures identified
Mixing operations (open systems)	No other specific measures identified
Mould forming	No other specific measures identified
Casting operations	No other specific measures identified
Machine Spraying	No other specific measures identified
Manual Spraying	No other specific measures identified

Rolling, Brushing	No other specific measures identified
Dipping, immersion and pouring	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	5e-4

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 given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025

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
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	130
Assumed domestic sewage treatment plant flow (m^3/d):	2000

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 carcinogenic 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

(http://cefic.org/en/reach-for-industries-libraries.html)

9 Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario Kerosenes	
Title	Use as a fuel
Use Descriptor	
Sector(s) of use	3
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 fuel additive) 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.
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
Drum/batch 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)	5.5e5
Fraction of regional tonnage used locally	1
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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
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 >= (%):	84.6
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	5.3e6
Assumed domestic sewage treatment plant flow (m^3/d):	2000
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	
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 carcinogenic 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 (http://cefic.org/en/reach-for-industries-libraries.html)	

10 Use of substance as a Fuel - Professional

Section 1 Exposure Scenario Kerosenes	
Title	Use as a fuel
Use Descriptor	
Sector(s) of use	22
Process category(ies)	1, 2, 3, 8a, 8b, 16
Environmental release category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) 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.
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)	4.4e6
Fraction of regional tonnage used locally	5.0e-4

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 given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
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
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 (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.9e5
Assumed domestic sewage treatment plant flow (m^3/d):	2000

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

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 (http://cefic.org/en/reach-for-industries-libraries.html)