

Safety Data Sheet

According to EC 1907/2006



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

1.1 Product identifier

Name: Gas Oil
Safety Data Sheet Number: 814649
MARPOL Annex I Category: Gas Oils, Including Ship's Bunkers
REACH Registration Number: 01-2119484664-27-0004

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

Intended Use: Heating and fuel oil for industrial applications
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 substance or mixture

Manufacturer: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
Customer Service: +44 (0)1469 571571
SDS Information: Email: SDS@P66.com
Email: ESDS@P66.com

1.4 Emergency telephone number +44 (0)1469 555348 (24 Hours)

Section 2: Hazards 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
H350 -- Carcinogenicity -- Category 1B
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

R10, Xn;R20, Xi;R38, Carc. Cat. 2;R45, Xn;R48/21, Xn;R65, N;R51/53

2.2 Label Elements



DANGER

H226: Flammable liquid and vapor.

H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H350: May cause cancer
H373: May cause damage to organs through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

P201: Obtain special instructions before use
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260: Do not breathe dust/fume/gas/mist/vapours/spray
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331: Do NOT induce vomiting
P501: Dispose of contents/container to approved disposal facility.

2.3 Other hazards

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 Mixture

Component	CASRN	EINECS	REACH Registration No.	Concentration ¹	CLP Classification ²	DSD Classification ³
Fuels, diesel	68334-30-5	269-822-7	Not applicable	90-100	H351	Carc.Cat.3; R40
Fatty acids, vegetable-oil, Me esters	68990-52-3	273-606-8	Not applicable	0-10	-	-
Fatty acids, tallow, Me esters	61788-61-2	262-989-7	Not applicable	0-10	-	-
Naphthalene	91-20-3	202-049-5	Not applicable	<1	H351,H302,H41 0	Xn; R22 Carc.Cat.3; R40 N; R50-53

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

² Regulation EC 1272/2008.

³ Superseded Directives 67/548/EEC and 1999/45/EC.

Total Sulfur: < 0.1

Gas oil for marine use contains <0.1% fatty acids, ME (FAME).

Section 4: First Aid Measures

4.1 Description of first aid measures

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

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

Inhalation (Breathing): 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 (Swallowing): 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

Acute: Minor respiratory irritation at high vapor concentrations.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

Other Comments: None

Section 5: Fire-Fighting 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). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors 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 sulfur may also be formed.

5.3 Special protective actions for firefighters

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 immediate hazard area and keep unauthorized personnel out. 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 vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

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

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized 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 spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3 Methods and material for containment and cleaning up

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

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

Section 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapors or mists. Use only outdoors or in well-ventilated area. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). 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. Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas.

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 sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

7.2 Conditions for safe storage, including any incompatibilities

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

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

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters

Component	Occupational Exposure Limits		
	ACGIH	UK-EH40	Other
Fuels, diesel	TWA: 100 mg/m ³ Skin	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---

Naphthalene	STEL: 15 ppm TWA: 10 ppm 2 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin	---	TWA: 0.2 mg/m ³ (as total of 17 PNAs measured by NIOSH Method 5506) (Phillips 66 Guidelines)
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STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values			
Component	ACGIH	EU 98/24/EC	UK-EH40
Fuels, diesel	---	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---
Naphthalene	---	---	---

--- = No Biological Limit Value

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)

Inhalation: 68.3 mg/m³/day

Dermal: 2.9 mg/kgbw/day

Consumer Derived No-Effect Level (DNEL)

Inhalation: 61.2 mg/m³/day

Dermal: 1.3 mg/kgbw/day

Ingestion: Not applicable

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

8.2 Exposure controls

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

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

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

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 program 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
Physical Form:	Liquid
Odor:	Diesel fuel
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	N/D
Initial Boiling Point/Range:	180 - 390 °C
Flash Point:	> 55 °C; (Closed Cup); (Marine Gas Oil >60°C)
Evaporation Rate (nBuAc=1):	N/D
Flammability (solid, gas):	Flammable
Upper Explosive Limits (vol % in air):	5.0
Lower Explosive Limits (vol % in air):	0.5
Vapour Pressure:	<0.3 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.82-0.875 @ 15°C
Solubility (ies):	Solubility in water: Negligible @20°C
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	250 °C
Decomposition Temperature:	N/D
Viscosity:	4.8 mm ² /s @ 20°C; 1.5-5.5 mm ² /s @ 40°C
Explosive Properties:	N/A
Oxidising Properties:	N/A

9.2 Other Information

Pour Point:	-24 °C
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Section 10: Stability and Reactivity

10.1 Reactivity	Not chemically reactive.
10.2 Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3 Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4 Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.
10.6 Hazardous decomposition products	Not anticipated under normal conditions of use.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled		4.65 mg/L (mist)
Skin Absorption	Unlikely to be harmful		>4.1 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

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.

Signs and Symptoms: While significant vapor 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.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

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 hematopoiesis and lymphocyte depletion.

Carcinogenicity: May cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

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

Reproductive Toxicity: Not expected to cause reproductive toxicity.

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 Program (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. Classification: H411; Chronic Cat 2.

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 and environmental fate

Releases to water will result in a hydrocarbon film floating and spreading on the surface. For the lighter components, volatilization is an important loss process and reduces the hazard to aquatic organisms. In air, the hydrocarbon vapors react readily with hydroxyl radicals with half-lives of less than one day. Photooxidation 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 91/689/EEC 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 its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2006/12/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	GAS OIL <i>or</i> DIESEL FUEL <i>or</i> 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	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</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
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 91/689/EEC on hazardous waste (European Waste Codes)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste

Export Rating: NLR (No License Required)

15.2 Chemical Safety Assessment

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

Section 16: Other Information

Date of Issue:	09/22/2011
Status:	FINAL
Previous Issue Date:	05/23/2011
Revised Sections or Basis for Revision:	Manufacturer (Section 1)
Safety Data Sheet Number:	814649
Language:	English

List of Relevant Hazard Statements:

H226: Flammable liquid and vapour
H302: Harmful if swallowed
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H350: May cause cancer
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

R10: Flammable
R20: Harmful by inhalation
R22: Harmful if swallowed
R38: Irritating to skin
R40: Limited evidence of a carcinogenic effect
R45: May cause cancer
R48/21: Harmful: danger of serious damage to health by prolonged exposure in contact with skin
R65: Harmful: may cause lung damage if swallowed
R66: Repeated exposure may cause skin dryness or cracking
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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 Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-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 Program; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

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Exposure Scenario Annex

Gas Oil

1. Manufacture of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.

Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.021
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-5
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.	
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 >= (%):	90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.3e6
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 Petrорisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	3.5e5
Fraction of regional tonnage used locally	0.043
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-5
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
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 >= (%):	51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m ³ /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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Drum and small package filling	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	

Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.002
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-6
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 sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
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 >= (%):	9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m ³ /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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Production or preparation or articles by tableting, compression, extrusion or pelletisation	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Laboratory activities	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374.
Storage	Store substance within a closed system.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.0011
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-5
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.	
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 >= (%):	60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.8e5
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
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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 any 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)	Handle substance within a closed system.
General exposures (open systems)	Provide extract ventilation to points where emissions occur.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Metal machining operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Treatment by dipping and pouring	Wear suitable gloves tested to EN374.
Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves (tested to EN374), coverall and eye protection.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Automated metal rolling/forming	Handle substance within a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

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)	1.0e4
Fraction of regional tonnage used locally	0.01
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-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 sediment. If discharging to domestic sewage treatment plant, no onsite 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 >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	7.8e4
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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 as Release agents or binders - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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), mould 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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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	Handle substance within a closed system.
Drum/batch transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mixing operations (closed systems)	No other specific measures identified.

Mixing operations (open systems)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mold forming	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Casting operations (open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN374.
Machine Spraying	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN374.
Manual Spraying	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

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)	1.4e4
Fraction of regional tonnage used locally	0.18

Frequency and duration of use

Continuous release.

Emission days (days/year)	100
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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-7
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 (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	1.7e5
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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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.
Material transfers (closed systems)	No other specific measures identified.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	Wear suitable gloves tested to EN374.
Mold forming	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations With local exhaust ventilation	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations Without local exhaust ventilation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection.
Spraying Manual Without local exhaust ventilation	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Spraying Manual Without local exhaust ventilation	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.9e3
Fraction of regional tonnage used locally	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year)	365
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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 sediment. If discharging to domestic sewage treatment plant, no onsite 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 >= (%):	8.3
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.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.2e1
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
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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 a Fuel - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

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.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
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)	4.5e6
Fraction of regional tonnage used locally	0.34
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 >= (%):	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	60.4
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
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):	5.5e6
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
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 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 temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
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.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.
Refuelling	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

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)	6.7e6
Fraction of regional tonnage used locally	0.0005
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-4
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 sediment. If discharging to domestic sewage treatment plant, no onsite 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 >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	1.4e5
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	
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	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 - Consumer

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	21
Product Category(ies)	13
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	

Section 2 Operational conditions and risk management measures	
2.1 Control of consumer exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 Pa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	For each use event, covers use amounts up to (g): 37500 Covers skin contact area up to (cm ²): 420
Other operational conditions affecting exposure	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2 hours per event
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
Liquid: Automotive Refuelling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.05. Covers outdoor use. No specific risk management measure identified beyond those operational conditions stated.
Liquid Garden Equipment - Use	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 750. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Garden Equipment - Refueling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 420.00. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m ³) under typical ventilation. Covers use in room size of (m ³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
<p>Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) 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 / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels 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. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.</p>	
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)	1.6e7
Fraction of regional tonnage used locally	0.0005
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	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.5e5
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	
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 consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	