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

1.1. Product identifier

   Substance name: Auto Diesel / DERV
   Other means of identification: G.O.R.V.; Ultra-Low Sulphur Diesel, AD10
   Safety Data Sheet Number: 814648
   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: Fuel
   Uses Advised Against: All others

1.3. Details of the supplier of the safety data sheet

   Manufacturer/Supplier: Phillips 66 Ltd, Humber Refinery
   South Killingholme, North Lincolnshire DN40 3DW
   Customer Service: +44 (0)1469 571571
   SDS Information:
   URL: www.Philips66.com
   Email: ESDS@P66.com

1.4. Emergency telephone number

   +44 (0)1469 571315 (24 Hours)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

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

   Superseded DSD Classification (67/548/EEC and 1999/45/EC):
   R10, Xn;R20, Xi;R38, Carc. Cat. 3;R40, R48, Xn;R65, N;R51/53

2.2. Label Elements

   DANGER

   Flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
Harmful if inhaled
Suspected of causing cancer
May cause damage to organs through prolonged or repeated exposure
Toxic to aquatic life with long lasting effects

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331 - Do NOT induce vomiting

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

SECTION 3: Composition/information on ingredients

3.1 Mixture

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CASRN</th>
<th>EINECS</th>
<th>REACH Registration No.</th>
<th>Concentration¹</th>
<th>CLP Classification²</th>
<th>DSD Classification³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuels, diesel</td>
<td>68334-30-5</td>
<td>269-822-7</td>
<td>01-2119484664-27-00 04</td>
<td>90-100</td>
<td>H351</td>
<td>Carc.Cat.3; R40</td>
</tr>
<tr>
<td>Fatty acids, C14-18 and C16-18-unsat., Me esters</td>
<td>67762-26-9</td>
<td>267-007-0</td>
<td>01-2119471662-36-00 19</td>
<td>0-10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fatty acids, C16-18 and C18-unsat., Me esters</td>
<td>67762-38-3</td>
<td>267-015-4</td>
<td>01-2119471664-32-01 03</td>
<td>0-10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>202-049-5</td>
<td>Not applicable</td>
<td>&lt;1</td>
<td>H351, H302, H41 0</td>
<td>Xn; R22 Carc.Cat.3; R40 N; R50-53</td>
</tr>
</tbody>
</table>

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 wt%

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, both acute and delayed
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. Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

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

SECTION 5: Firefighting measures

5.1 Extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). 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 and contain 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

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. 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.

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

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

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

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

7.2 Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated 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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Occupational Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACGIH</td>
</tr>
<tr>
<td>Fuels, diesel</td>
<td>TWA: 100 mg/m³ Skin</td>
</tr>
<tr>
<td>Fatty acids, C14-18 and C16-18-unsat., Me esters</td>
<td>---</td>
</tr>
<tr>
<td>Fatty acids, C16-18 and C18-unsat., Me esters</td>
<td>---</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>STEL: 15 ppm TWA: 10 ppm 10 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin</td>
</tr>
</tbody>
</table>

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

8.2 Exposure controls

- **Environmental 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 straw colored
Physical Form: Liquid
Odour: Diesel fuel
Odour Threshold: N/D
pH: N/A
Melting/Freezing Point: N/D
Initial Boiling Point/Range: 165 - 375 °C
Flash Point: > 55 °C; (Closed Cup)
Evaporation Rate (nBuAc=1): N/D
Flammability (solid, gas): N/A
Upper Explosive Limits (vol % in air): 6.0
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): 0.82-0.845 @ 15°C
Solubility (ies): Solubility in water: Negligible @20°C
Partition Coefficient (n-octanol/water) (Kow): N/D
Auto-ignition Temperature: 250-270 °C
Decomposition Temperature: N/D
Viscosity: 4.8 mm²/s @ 20°C; 2-4.5 mm²/s @ 40°C
Explosive Properties: N/A
Oxidising Properties: N/D

9.2 Other Information

Pour Point: -24 °C

SECTION 10: Stability and reactivity

10.1 Reactivity

Not chemically reactive.

10.2 Chemical stability

Stable under normal ambient and anticipated conditions of use.

10.3 Possibility of hazardous reactions

Hazardous reactions not anticipated.

10.4 Conditions to avoid

Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

10.5 Incompatible materials

Avoid contact with strong oxidizing agents and strong reducing agents.

10.6 Hazardous decomposition products

Not anticipated under normal conditions of use.

SECTION 11: Toxicological information

11.1 Information on Toxicological Effects of Substance/Mixture

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Acute Toxicity</th>
<th>Hazard</th>
<th>Additional Information</th>
<th>LC50/LD50 Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Harmful if inhaled</td>
<td></td>
<td></td>
<td>4.4 mg/L (mist, estimated) (rat)</td>
</tr>
<tr>
<td>Dermal</td>
<td>Unlikely to be harmful</td>
<td></td>
<td></td>
<td>&gt;2 g/kg (rabbit)</td>
</tr>
<tr>
<td>Oral</td>
<td>Unlikely to be harmful</td>
<td></td>
<td></td>
<td>&gt; 5 g/kg (rat)</td>
</tr>
</tbody>
</table>
Aspiration Hazard: May be fatal if swallowed and enters airways.

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

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: Not expected to be a skin sensitizer.

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

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

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

Carcinogenicity: Suspected of causing cancer. 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.

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

11.2 Information on Hazardous Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two-year inhalation studies in both rats and mice. The US National Toxicology 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.

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 2008/98/EC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies. This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and it's contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2008/98/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.

Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

SECTION 14: Transport information

14.1 UN number
UN1202

14.2 UN proper shipping name
DIESEL FUEL or GASOIL or HEATING OIL, LIGHT

14.3 Transport hazard class(es)
3

14.4 Packing group
III

14.5 Environmental hazards
Marine pollutant - Environmentally Hazardous

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

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
SECTION 16: Other information

Date of Issue: 05-Sep-2014
Status: FINAL
Previous Issue Date: 22-Sep-2011
Revised Sections or Basis for Revision:
- Identified Hazards (Section 2)
- Precautionary Statement(s) (Section 2)
- Composition (Section 3)
- Exposure limits (Section 8)
- Toxicological (Section 11)

Safety Data Sheet Number: 814648
Language: English

List of Relevant Hazard Statements:
H226: Flammable liquid and vapour
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H351: Suspected of causing cancer
H373: May cause damage to organs through prolonged or repeated exposure
H411: Toxic to aquatic life with long lasting effects
Repeted exposure may cause skin dryness or cracking
H302: Harmful if swallowed
H410: Very toxic to aquatic life with long lasting effects

R10: Flammable.
R20: Harmful by inhalation.
R38: Irritating to skin.
R40: Limited evidence of a carcinogenic effect.
R48: Danger of serious damage to health by prolonged exposure.
R65: Harmful: may cause lung damage if swallowed
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R66: Repeated exposure may cause skin dryness or cracking.
R22: Harmful if swallowed.
R50/53: Very 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
- INSHNT = 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:
The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.
## 1. Manufacture of substance - Industrial

### Section 1 Exposure Scenario
**Vacuum or Hydrocracked Gas Oils and Distillate Fuels**

<table>
<thead>
<tr>
<th>Title</th>
<th>Manufacture of substance</th>
</tr>
</thead>
</table>

#### Use Descriptor

<table>
<thead>
<tr>
<th>Sector(s) of Use</th>
<th>3, 8, 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 4, 8a, 8b, 15</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>1, 4</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 1.1.v1</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently).</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Operation is carried out at elevated temperature (&gt;20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**Contribution Scenarios / Product Category**

<table>
<thead>
<tr>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
</table>

**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.
<table>
<thead>
<tr>
<th>Equipment cleaning and maintenance</th>
<th>Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory activities</td>
<td>No other specific measures identified.</td>
</tr>
<tr>
<td>Bulk product storage</td>
<td>Store substance within a closed system.</td>
</tr>
</tbody>
</table>

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)   | 2.9e7 |
| 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 (m³/d) | 10000 |

#### Conditions and measures related to external treatment of waste for disposal

During manufacturing no waste of the substance is generated.
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**

<table>
<thead>
<tr>
<th>Sector(s) of Use</th>
<th>3, 8, 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 4, 8a, 8b, 15</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>6a</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 6.1.a.v1</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently).</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Operation is carried out at elevated temperature (&gt;20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**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.

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 these adverse effects.

## 2.2 Control of environmental exposure

### Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

### Amounts used

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of EU tonnage used in region</td>
<td>0.1</td>
</tr>
<tr>
<td>Regional use tonnage (tonnes/year)</td>
<td>3.5e5</td>
</tr>
<tr>
<td>Fraction of regional tonnage used locally</td>
<td>0.043</td>
</tr>
</tbody>
</table>

### Frequency and duration of use

Continuous release.

### Emission days (days/year)

300

### Environmental factors not influenced by risk management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local freshwater dilution factor</td>
<td>10</td>
</tr>
<tr>
<td>Local marine water dilution factor</td>
<td>100</td>
</tr>
</tbody>
</table>

### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release fraction to air from process (initial release prior to RMM)</td>
<td>1.0e-3</td>
</tr>
<tr>
<td>Release fraction to wastewater from process (initial release prior to RMM)</td>
<td>3.0e-5</td>
</tr>
<tr>
<td>Release fraction to soil from process (initial release prior to RMM)</td>
<td>0.001</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat air emission to provide a typical removal efficiency of (%)</td>
<td>80</td>
</tr>
<tr>
<td>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency &gt;= (%)</td>
<td>51.7</td>
</tr>
<tr>
<td>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of &gt;= (%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Organisation measures to prevent/limit release from site

- Prevent discharge of undisolved 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

<table>
<thead>
<tr>
<th>Condition</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated substance removal from wastewater via domestic sewage treatment (%)</td>
<td>94.1</td>
</tr>
<tr>
<td>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</td>
<td>94.1</td>
</tr>
<tr>
<td>Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d)</td>
<td>4.1e5</td>
</tr>
<tr>
<td>Assumed domestic sewage treatment plant flow (m³/d)</td>
<td>2000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sector(s) of Use</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector(s)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process Category(ies)</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 4, 8a, 8b, 9, 15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Release Category(ies)</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Release Category(ies)</td>
<td>1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Environmental Release Category</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 1.1b.v1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100% (unless stated differently).</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

### Contributing Scenarios / Product Category

<table>
<thead>
<tr>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
</table>

#### 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.

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 aim 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)** | 2.8e7 |
| **Fraction of regional tonnage used locally** | 0.002 |

**Frequency and duration of use**
- Continuous release.

**Emulsion 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 (Msafe) based on release following total wastewater treatment removal (kg/d): 4.1e5
- Assumed domestic sewage treatment plant flow (m³/d): 2000

**Conditions and measures related to external treatment of waste for disposal**
- This substance is consumed during use and no waste of the substance is generated.

**Conditions and measures related to external recovery of waste**
- This substance is consumed during use and no waste of the substance is generated.

**Section 3 Exposure Estimation**

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

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

**Section 4 Guidance to check compliance with the Exposure Scenario**

4.1 Health
- 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, 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](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**

<table>
<thead>
<tr>
<th>Sector(s) of Use</th>
<th>3, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>2</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 2.2.v1</td>
</tr>
</tbody>
</table>

**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, pelletization, 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**

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently)</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**Contributing Scenarios / Product Category**

<table>
<thead>
<tr>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
</table>

**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 tabletting, 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.

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) | 2.8e7 |
| 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 (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).

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 / 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)
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 (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
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**

<table>
<thead>
<tr>
<th>Sector(s) of Use</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 4, 6, 7, 8b, 10, 13, 14</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>4</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 4.10a.v1</td>
</tr>
</tbody>
</table>

**Processes, tasks, activities covered**
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mold forming and casting, and handling of waste

**Section 2 Operational conditions and risk management measures**

### 2.1 Control of worker exposure

**Product Characteristics**

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently).</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**Contributing Scenarios / Product Category**

<table>
<thead>
<tr>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
</table>

**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 specific activity 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

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated substance removal from wastewater via domestic sewage treatment (%)</td>
<td>94.1</td>
</tr>
<tr>
<td>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</td>
<td>94.1</td>
</tr>
<tr>
<td>Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d)</td>
<td>1.7e5</td>
</tr>
<tr>
<td>Assumed domestic sewage treatment plant flow (m³/d)</td>
<td>2000</td>
</tr>
</tbody>
</table>

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

<p>| Physical form of product | Liquid, vapour pressure &lt; 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. |</p>
<table>
<thead>
<tr>
<th>Contributing Scenarios / Product Category</th>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>General measures applicable to all activities</td>
<td>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.</td>
</tr>
<tr>
<td>General measures (skin irritants)</td>
<td>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.</td>
</tr>
<tr>
<td>Material transfers (closed systems)</td>
<td>No other specific measures identified.</td>
</tr>
<tr>
<td>Drum/batch transfers</td>
<td>Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>Mixing operations (closed systems)</td>
<td>No other specific measures identified.</td>
</tr>
<tr>
<td>Mixing operations (open systems)</td>
<td>Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>Mold forming</td>
<td>Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>Casting operations With local exhaust ventilation</td>
<td>Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>Casting operations Without local exhaust ventilation</td>
<td>Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection.</td>
</tr>
<tr>
<td>Spraying Manual Without local exhaust ventilation</td>
<td>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.</td>
</tr>
<tr>
<td>Spraying Manual Without local exhaust ventilation</td>
<td>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.</td>
</tr>
<tr>
<td>Manual Roller, spreader, flow application</td>
<td>Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</td>
</tr>
<tr>
<td>Equipment cleaning and maintenance</td>
<td>Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.</td>
</tr>
<tr>
<td>Storage</td>
<td>Store substance within a closed system.</td>
</tr>
</tbody>
</table>
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 |

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 [here](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**

<table>
<thead>
<tr>
<th>Title</th>
<th>Use as a fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use Descriptor</strong></td>
<td></td>
</tr>
<tr>
<td>Sector(s) of Use</td>
<td>3</td>
</tr>
<tr>
<td>Process Category(ies)</td>
<td>1, 2, 3, 8a, 8b, 16</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>7</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 7.12a.v1</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Physical form of product</th>
<th>Liquid, vapour pressure &lt; 0.5 kPa at STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently)</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**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. |

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

<table>
<thead>
<tr>
<th></th>
<th>0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of EU tonnage used in region</td>
<td></td>
</tr>
<tr>
<td>Regional use tonnage (tonnes/year)</td>
<td>4.56</td>
</tr>
<tr>
<td>Fraction of regional tonnage used locally</td>
<td>0.34</td>
</tr>
</tbody>
</table>

#### Frequency and duration of use

Continuous release.

<table>
<thead>
<tr>
<th></th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission days (days/year)</td>
<td></td>
</tr>
</tbody>
</table>

#### Environmental factors not influenced by risk management

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Local freshwater dilution factor</td>
<td>10</td>
</tr>
<tr>
<td>Local marine water dilution factor</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Other given operational conditions affecting environmental exposure

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Release fraction to air from process (initial release prior to RMM)</td>
<td>5.0e-3</td>
</tr>
<tr>
<td>Release fraction to wastewater from process (initial release prior to RMM)</td>
<td>0.00001</td>
</tr>
<tr>
<td>Release fraction to soil from process (initial release prior to RMM)</td>
<td>0</td>
</tr>
</tbody>
</table>

#### 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.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat air emission to provide a typical removal efficiency of (%):</td>
<td>95</td>
</tr>
<tr>
<td>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency &gt;= (%):</td>
<td>97.7</td>
</tr>
<tr>
<td>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of &gt;= (%):</td>
<td>60.4</td>
</tr>
</tbody>
</table>

#### 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 (m³/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 / 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)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical conditions and measures at process level (source) to prevent release</td>
<td>0.00001</td>
</tr>
<tr>
<td>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</td>
<td>0.00001</td>
</tr>
<tr>
<td>Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.</td>
<td></td>
</tr>
<tr>
<td>Treat air emission to provide a typical removal efficiency of (%)</td>
<td>N/A</td>
</tr>
<tr>
<td>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency &gt;= (%)</td>
<td>8.3</td>
</tr>
<tr>
<td>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of &gt;= (%)</td>
<td>0.00001</td>
</tr>
<tr>
<td>Organisation measures to prevent/limit release from site</td>
<td></td>
</tr>
<tr>
<td>Prevent discharge of undissolved substance to or recover from onsite wastewater.</td>
<td></td>
</tr>
<tr>
<td>Do not apply industrial sludge to natural soils.</td>
<td></td>
</tr>
<tr>
<td>Sludge should be incinerated, contained or reclaimed.</td>
<td></td>
</tr>
<tr>
<td>Conditions and measures related to municipal sewage treatment plant</td>
<td></td>
</tr>
<tr>
<td>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</td>
<td>94.1</td>
</tr>
<tr>
<td>Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d)</td>
<td>1.4e5</td>
</tr>
<tr>
<td>Assumed domestic sewage treatment plant flow (m³/d)</td>
<td>2000</td>
</tr>
<tr>
<td>Conditions and measures related to external treatment of waste for disposal</td>
<td></td>
</tr>
<tr>
<td>Combustion emissions limited by required exhaust emission controls.</td>
<td></td>
</tr>
<tr>
<td>Combustion emissions considered in regional exposure assessment.</td>
<td></td>
</tr>
<tr>
<td>Conditions and measures related to external recovery of waste</td>
<td></td>
</tr>
<tr>
<td>External recovery and recycling of waste should comply with applicable local and/or national regulations.</td>
<td></td>
</tr>
</tbody>
</table>

### Exposure Estimation

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

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

### Guidance to check compliance with the Exposure Scenario

#### 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.

#### 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

<table>
<thead>
<tr>
<th>Title</th>
<th>Use as a fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Descriptor</td>
<td></td>
</tr>
<tr>
<td>Sector(s) of Use</td>
<td>21</td>
</tr>
<tr>
<td>Product Category(ies)</td>
<td>13</td>
</tr>
<tr>
<td>Environmental Release Category(ies)</td>
<td>9a, 9b</td>
</tr>
<tr>
<td>Specific Environmental Release Category</td>
<td>ESVOC SpERC 9.12c.v1</td>
</tr>
<tr>
<td>Processes, tasks, activities covered</td>
<td>Covers consumer uses in liquid fuels</td>
</tr>
</tbody>
</table>
## Section 2  Operational conditions and risk management measures

### 2.1 Control of consumer exposure

#### Product Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical form of product</td>
<td>Liquid, vapour pressure &gt; 10 Pa at STP</td>
</tr>
<tr>
<td>Concentration of substance in product</td>
<td>Covers percentage substance in the product up to 100 % (unless stated differently).</td>
</tr>
<tr>
<td>Frequency and duration of use</td>
<td>For each use event, covers use amounts up to (g): 37500 Covers skin contact area up to (cm²): 420</td>
</tr>
<tr>
<td>Other operational conditions affecting exposure</td>
<td>Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2 hours per event</td>
</tr>
</tbody>
</table>

#### Contributing Scenarios / Product Category

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Specific Risk Management Measures &amp; Operating Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid: Automotive Refuelling</td>
<td>Covers concentrations up to (%): 100%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers use in room size of (m³): 100. Covers exposure up to (hours/event): 0.05. Covers outdoor use. No specific risk management measure identified beyond those operational conditions stated.</td>
</tr>
<tr>
<td>Liquid Garden Equipment - Use</td>
<td>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 (m³): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated.</td>
</tr>
<tr>
<td>Liquid: Garden Equipment - Refueling</td>
<td>Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm²): 420.00. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m³) under typical ventilation. Covers use in room size of (m³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance</td>
<td>is complex UVCB. Predominantly hydrophobic.</td>
</tr>
</tbody>
</table>

#### Amounts used

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of EU tonnage used in region</td>
<td>0.1</td>
</tr>
<tr>
<td>Regional use tonnage (tonnes/year)</td>
<td>1.6e7</td>
</tr>
<tr>
<td>Fraction of regional tonnage used locally</td>
<td>0.0005</td>
</tr>
</tbody>
</table>

#### Frequency and duration of use

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission days (days/year)</td>
<td>365</td>
</tr>
</tbody>
</table>

#### Environmental factors not influenced by risk management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local freshwater dilution factor</td>
<td>10</td>
</tr>
</tbody>
</table>
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 (m³/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).