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## SAFETY DATA SHEET

<b>SECTION 1</b>	<b>IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING</b>
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As of the revision date above, this (M)SDS meets the regulations in the United Kingdom & Ireland.

### 1.1. PRODUCT IDENTIFIER

**Product Name:** MARINE DISTILLATES  
**Product Description:** Petroleum Hydrocarbons  
**Product Code:** 708628-60  
**Registration Name:**

Fuels, diesel

**Registration Number:**

01-2119484664-27-0027; 01-2119484664-27

Trade Names	Trade Names
BUNKER MGO .1%S UNDYED MARDIST	

### 1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

**Intended Use:** Fuel

**Identified Uses:**

- Manufacture of substance
- Distribution of substance
- Use as an intermediate
- Formulation and (re)packing of substances and mixtures
- Use in Coatings - Industrial
- Use in oil field drilling and production operations - Industrial
- Lubricants - Industrial
- Metal working fluids / rolling oils - Industrial
- Use as binders and release agents - Industrial
- Use as a fuel - Industrial
- Functional Fluids - Industrial
- Rubber production and processing
- Use in Coatings - Professional
- Use in oil field drilling and production operations - Professional
- Lubricants - Professional (Low Release)
- Lubricants - Professional (High Release)
- Use as binders and release agents - Professional
- Use as a fuel - Professional
- Road and construction applications
- Explosives manufacture & use
- Use as a fuel - Consumer

See Section 16 for list of REACH Use Descriptors for Identified Uses shown above.

**Uses advised against:** This product is not recommended for any industrial, professional or consumer use other than the Identified Uses above.

### 1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

**Supplier:** ATLANTIC ENERGY  
 3, quai du Confluent  
 78700 Conflans sainte Honorine  
 France

**Supplier General Contact:** +33 4 69 96 06 96  
**Internet Address:** [www.atlantic-energy.fr](http://www.atlantic-energy.fr)  
**E-Mail:** [bunkers@oil-atlantic.energy](mailto:bunkers@oil-atlantic.energy)

### 1.4. EMERGENCY TELEPHONE NUMBER

**National Poison Control Centre:** +33 7.85.46.84.97 / +33 6.32.25.19.61 / +33 6.07.97.11.06

<b>SECTION 2</b>	<b>HAZARDS IDENTIFICATION</b>
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#### 2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

**Classification according to Regulation (EC) No 1272/2008**

Acute inhalation toxicant: Category 4. Skin irritation: Category 2. Carcinogen: Category 2. Specific target organ toxicant (repeated exposure): Category 2. Aspiration

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toxicant: Category 1.

Chronic aquatic toxicant: Category 2.

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.

**Classification according to EU Directive 67/548/EEC / 1999/45 EC**

| Carc. Cat. 3; R40 | Xn; R20 | Xn; R65 | Xi; R38 | N; R51/53 |  
Category 3 Carcinogen. Harmful. Irritant. Dangerous for the environment.

R40; Limited evidence of a carcinogenic effect. R20; Harmful by inhalation. R65; Harmful: may cause lung damage if swallowed. R38; Irritating to skin. R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

## 2.2. LABEL ELEMENTS

### Label elements according to Regulation (EC) No 1272/2008

#### Pictograms:



**Signal Word:** Danger

#### Hazard Statements:

H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled. H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects.

#### Precautionary Statements:

P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P260: Do not breathe mist / vapours. P264: Wash skin thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. 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. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P308 + P313: IF exposed or concerned: Get medical advice/attention. P314: Get medical advice/attention if you feel unwell. P331: Do NOT induce vomiting. P332 + P313: If skin irritation occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P391: Collect spillage.

P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.

P501: Dispose of contents and container in accordance with local regulations.

**Contains:** Fuels, diesel

## 2.3. OTHER HAZARDS

#### Physical / Chemical Hazards:

Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Combustible.

#### Health Hazards:

May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs.

#### Environmental Hazards:

No additional hazards. Material does not meet the criteria for PBT or vPvB in accordance with REACH Annex XIII.



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### 3.1. SUBSTANCES

This material is defined as a substance.

#### Reportable hazardous substance(s) complying with the classification criteria and/or with an exposure limit (OEL)

Name	CAS#	EC#	Registration#	Concentration*	GHS/CLP classification
Fuels, diesel	68334-30-5	269-822-7	01-2119484664-27	100 %	Acute Tox. 4 H332, Asp. Tox. 1 H304, Carc. 2 H351, [Flam. Liq. 4 H227], STOT RE 2 H373, Skin Irrit. 2 H315, [Aquatic Acute 2 H401], Aquatic Chronic 2 H411

Note - any classification in brackets is a GHS building block that was not adopted by the EU in the CLP regulation (No 1272/2008) and therefore is not applicable in the EU or in non-EU countries which have implemented the CLP regulation and is shown for informational purposes only.

Name	CAS#	EC#	Registration#	Concentration*	DSD Symbols/Risk Phrases
Fuels, diesel	68334-30-5	269-822-7	01-2119484664-27	100 %	Xn;R20, Xi;R38, Xn;Carc. Cat. 3;R40, Xn;R65, N;R51/53

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

NOTE: Composition may contain up to 0.5% performance additives and / or dyes.

Note: See (M)SDS Section 16 for full text of the R-Phrases. See (M)SDS Section 16 for full text of hazard statements.

3.2. MIXTURES Not Applicable. This product is regulated as a substance.

## SECTION 4 FIRST AID MEASURES

### 4.1. DESCRIPTION OF FIRST AID MEASURES

#### INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

#### SKIN CONTACT

Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

#### EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

#### INGESTION

Seek immediate medical attention. Do not induce vomiting.

### 4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Headache, dizziness, drowsiness, nausea and other CNS effects. Itching, pain, redness, swelling of skin. Local necrosis as evidenced by delayed onset of pain and tissue damage a few hours after injection.

### 4.3. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

## SECTION 5 FIRE FIGHTING MEASURES

### 5.1. EXTINGUISHING MEDIA

**Suitable Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Unsuitable Extinguishing Media:** Straight streams of water

### 5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

**Hazardous Combustion Products:** Oxides of carbon, Aldehydes, Sulphur oxides, Smoke, Fume, Incomplete combustion products

### 5.3. ADVICE FOR FIRE FIGHTERS

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

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**Unusual Fire Hazards:** Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

#### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** >60°C (140°F) [Typical]

**Upper/Lower Flammable Limits (Approximate volume % in air):** UEL: 7.0 LEL: 0.6 [test method unavailable]

**Autoignition Temperature:** >250°C (482°F) [test method unavailable]

### SECTION 6 ACCIDENTAL RELEASE MEASURES

#### 6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

##### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

##### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H<sub>2</sub>S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

#### 6.2. ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

#### 6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

#### 6.4. REFERENCES TO OTHER SECTIONS

See Sections 8 and 13.

### SECTION 7 HANDLING AND STORAGE

#### 7.1. PRECAUTIONS FOR SAFE HANDLING

Avoid all personal contact. Do not siphon by mouth. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

#### 7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be earthed and bonded to prevent accumulation of static charge. Keep away from

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incompatible materials.

**7.3. SPECIFIC END USES:** Section 1 informs about identified end-uses. No industrial or sector specific guidance available.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1. CONTROL PARAMETERS

#### EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard		Note	Source
Fuels, diesel	Stable Aerosol.	TWA	5 mg/m <sup>3</sup>		ExxonMobil
Fuels, diesel	Vapour.	TWA	200 mg/m <sup>3</sup>		ExxonMobil
Fuels, diesel [total hydrocarb, vapor&aerosol]	Inhalable fraction and vapour	TWA	100 mg/m <sup>3</sup>	Skin	ACGIH

Note: Information about recommended monitoring procedures can be obtained from the relevant agency(ies)/institute(s):  
UK Health and Safety Executive (HSE)

#### DERIVED NO EFFECT LEVEL (DNEL)/DERIVED MINIMAL EFFECT LEVEL (DMEL)

##### Worker

Substance Name	Dermal	Inhalation
Fuels, diesel	NA	NA

##### Consumer

Substance Name	Dermal	Inhalation	Oral
Fuels, diesel	NA	NA	NA

Note: The Derived No Effect Level (DNEL) is an estimated safe level of exposure that is derived from toxicity data in accord with specific guidance within the European REACH regulation. The DNEL may differ from an Occupational Exposure Limit (OEL) for the same chemical. OELs may be recommended by an individual company, a governmental regulatory body or an expert organization, such as the Scientific Committee for Occupational Exposure Limits (SCOEL) or the American Conference of Governmental Industrial Hygienists (ACGIH). OELs are considered to be safe exposure levels for a typical worker in an occupational setting for an 8-hour work shift, 40 hour work week, as a time weighted average (TWA) or a 15 minute short-term exposure limit (STEL). While also considered to be protective of health, OELs are derived by a process different from that of REACH.

#### PREDICTED NO EFFECT CONCENTRATION (PNEC)

Substance Name	Aqua (fresh water)	Aqua (marine water)	Aqua (intermittent release)	Sewage treatment plant	Sediment	Soil	Oral (secondary poisoning)
Fuels, diesel	NA	NA	NA	NA	NA	NA	NA

For hydrocarbon UVCBs, no single PNEC value is identified for the overall substance or used in risk assessment calculations. Therefore, no PNEC values are disclosed in the above table. For further information, please contact ExxonMobil.

### 8.2. EXPOSURE CONTROLS

#### ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:  
Use explosion-proof ventilation equipment to stay below exposure limits.

#### PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator Type A filter material, Type P filter material., European Committee for Standardization (CEN) standards EN 136, 140 and 405 provide respirator masks and EN 149 and 143 provide filter recommendations.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

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**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves. Nitrile, minimum 0.38 mm thickness or comparable protective barrier material with a high performance level for continuous contact use conditions, permeation breakthrough minimum 480 minutes in accordance with CEN standards EN 420 and EN 374.

**Eye Protection:** If contact with material is likely, chemical goggles are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

For Summary of Risk Management Measures across all identified uses, see Annex.

#### ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**Note:** Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

#### 9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Liquid  
**Colour:** Colourless  
**Odour:** Petroleum/Solvent  
**Odour Threshold:** No data available  
**pH:** Not technically feasible  
**Melting Point:** No data available  
**Freezing Point:** No data available  
**Initial Boiling Point / and Boiling Range:** > 180°C (356°F) [test method unavailable]  
**Flash Point [Method]:** >60°C (140°F) [Typical]  
**Evaporation Rate (n-butyl acetate = 1):** No data available  
**Flammability (Solid, Gas):** Not technically feasible  
**Upper/Lower Flammable Limits (Approximate volume % in air):** UEL: 7.0 LEL: 0.6 [test method unavailable]  
**Vapour Pressure:** < 0.04 kPa (0.3 mm Hg) at 20 °C [test method unavailable]  
**Vapour Density (Air = 1):** No data available  
**Relative Density (at 15 °C):** 0.85 [test method unavailable]  
**Solubility(ies): water** Negligible  
**Partition coefficient (n-Octanol/Water Partition Coefficient):** > 3.5 [test method unavailable]  
**Autoignition Temperature:** >250°C (482°F) [test method unavailable]  
**Decomposition Temperature:** No data available  
**Viscosity:** 3 cSt (3 mm<sup>2</sup>/sec) at 40°C [test method unavailable]  
**Explosive Properties:** None  
**Oxidizing Properties:** None

#### 9.2. OTHER INFORMATION

**Density (at 15 °C):** 800 kg/m<sup>3</sup> (6.68 lbs/gal, 0.8 kg/dm<sup>3</sup>) - 910 kg/m<sup>3</sup> (7.59 lbs/gal, 0.91 kg/dm<sup>3</sup>) [test method unavailable]

### SECTION 10 STABILITY AND REACTIVITY

**10.1. REACTIVITY:** See sub-sections below.

**10.2. CHEMICAL STABILITY:** Material is stable under normal conditions.

**10.3. POSSIBILITY OF HAZARDOUS REACTIONS:** Hazardous polymerization will not occur.

**10.4. CONDITIONS TO AVOID:** Open flames and high energy ignition sources.

**10.5. INCOMPATIBLE MATERIALS:** Halogens, Strong Acids, Strong Bases, Strong oxidisers



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**10.6. HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

SECTION 11	TOXICOLOGICAL INFORMATION
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**11.1. INFORMATION ON TOXICOLOGICAL EFFECTS**

Hazard Class	Conclusion / Remarks
<b>Inhalation</b>	
Acute Toxicity: (Rat) 4 hour(s) LC50 4100 mg/m <sup>3</sup> (Vapor and aerosol)	Moderately toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
<b>Ingestion</b>	
Acute Toxicity (Rat): LD50 > 5000 mg/kg Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401
<b>Skin</b>	
Acute Toxicity (Rabbit): LD50 > 5000 mg/kg Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 434
Skin Corrosion/Irritation (Rabbit): Data available. Test scores or other study results meet criteria for classification.	Irritating to the skin. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
<b>Eye</b>	
Serious Eye Damage/Irritation (Rabbit): Data available. Test scores or other study results do not meet criteria for classification.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
<b>Sensitisation</b>	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 475
Carcinogenicity: Data available.	Caused cancer in laboratory animals, but the relevance to humans is uncertain. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 451
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
<b>Specific Target Organ Toxicity (STOT)</b>	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Concentrated, prolonged or deliberate exposure may cause organ damage. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 410 413

**OTHER INFORMATION**  
For the product itself:

Sensitisation: Non-sensitising to the skin of laboratory animals.  
 Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.  
 Diesel fuel: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.  
 Diesel exhaust fumes: Carcinogenic in animal tests. Inhalation exposures to exhaust for 2 years in test animals resulted in lung tumours and lymphoma. Extract of particulate produced skin tumours in test animals. Caused mutations in-vitro.

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data available for the material, the components of the material, and similar materials.

**12.1. TOXICITY**

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

**12.2. PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Material -- Expected to be inherently biodegradable

**Atmospheric Oxidation:**

Majority of components -- Expected to degrade rapidly in air

**12.3. BIOACCUMULATIVE POTENTIAL**

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

**12.4. MOBILITY IN SOIL**

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.  
 Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.



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Majority of components -- Low potential to migrate through soil.

#### 12.5. PERSISTENCE, BIOACCUMULATION AND TOXICITY FOR SUBSTANCE(S)

This product is not, or does not contain, a substance that is a PBT or a vPvB.

#### 12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

### ECOLOGICAL DATA

#### Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Fish	LL50 1 - 100 mg/l: data for similar materials
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL50 1 - 1000 mg/l: data for similar materials
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	EL50 1 - 100 mg/l: data for similar materials
Aquatic - Chronic Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 1 - 10 mg/l: data for similar materials

#### Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results: Basis
Water	Ready Biodegradability	28 day(s)	Percent Degraded < 60 : similar material

### SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

#### 13.1. WASTE TREATMENT METHODS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

### REGULATORY DISPOSAL INFORMATION

European Waste Code: 13 07 01\*

NOTE: These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).

This material is considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

### SECTION 14 TRANSPORT INFORMATION

#### LAND (ADR/RID)

14.1. UN Number: 1202  
14.2. UN Proper Shipping Name (Technical Name): GAS OIL  
14.3. Transport Hazard Class(es): 3  
14.4. Packing Group: III  
14.5. Environmental Hazards: Yes  
14.6. Special Precautions for users:  
Proper Shipping Name Suffix: Special Provision 640M  
Classification Code: F1  
Label(s) / Mark(s): 3, EHS  
Hazard ID Number: 30  
Hazchem EAC: 3Y

#### INLAND WATERWAYS (ADNR/ADN)

14.1. UN (or ID) Number: 1202  
14.2. UN Proper Shipping Name (Technical Name): GAS OIL (Diesel oil..C9-20)



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14.3. Transport Hazard Class(es): 3  
 14.4. Packing Group: III  
 14.5. Environmental Hazards: Yes  
 14.6. Special Precautions for users:  
 Hazard ID Number: 30  
 Label(s) / Mark(s): 3 (N2, F), EHS

**SEA (IMDG)**

14.1. UN Number: 3082  
 14.2. UN Proper Shipping Name (Technical Name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Diesel oil..C9-20)  
 14.3. Transport Hazard Class(es): 9  
 14.4. Packing Group: III  
 14.5. Environmental Hazards: Marine Pollutant  
 14.6. Special Precautions for users:  
 Label(s): 9  
 EMS Number: F-A, S-F  
 Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Diesel oil..C9-20), 9, PG III, (60°C c.c.), MARINE POLLUTANT

**SEA (MARPOL 73/78 Convention - Annex II):**

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

**AIR (IATA)**

14.1. UN Number: 3082  
 14.2. UN Proper Shipping Name (Technical Name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Diesel oil..C9-20)  
 14.3. Transport Hazard Class(es): 9  
 14.4. Packing Group: III  
 14.5. Environmental Hazards: Yes  
 14.6. Special Precautions for users:  
 Label(s) / Mark(s): 9, EHS  
 Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Diesel oil..C9-20), 9, PG III

<b>SECTION 15</b>	<b>REGULATORY INFORMATION</b>
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**REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS**

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, IECSC, KECI, PICCS, TSCA

**15.1. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE**

**Applicable EU Directives and Regulations:**

1907/2006 [... on the Registration, Evaluation, Authorisation and Restriction of Chemicals ... and amendments thereto]  
 92/85/EEC [...pregnant workers...recently given birth or...breastfeeding directive]  
 94/33/EC [...on the protection of young people at work]  
 96/82/EC as extended by 2003/105/EC [... on the control of major-accident hazards involving dangerous substances]. Product contains a substance that falls within the criteria defined in Annex I. Refer to Directive for details of requirements taking into account the volume of product stored on site.  
 98/24/EC [... on the protection of workers from the risk related to chemical agents at work ...]. Refer to Directive for details of requirements.  
 1272/2008 [on classification, labelling and packaging of substances and mixtures.. and amendments thereto]  
 Refer to the relevant EU/national regulation for details of any actions or restrictions required by the above Regulation(s)/Directive(s).

**15.2. CHEMICAL SAFETY ASSESSMENT**

**REACH Information:** A Chemical Safety Assessment has been carried out for one or more substances present in the material.

<b>SECTION 16</b>	<b>OTHER INFORMATION</b>
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**IDENTIFIED USES:**

Manufacture of substance (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU10, SU3, SU8, SU9)  
 Distribution of substance (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU3, SU8, SU9)  
 Use as an intermediate (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU3, SU8, SU9)  
 Formulation and (re)packing of substances and mixtures (PROC1, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, SU10, SU3)  
 Use in Coatings - Industrial (PROC1, PROC10, PROC13, PROC15, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, SU3)  
 Use in oil field drilling and production operations - Industrial (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU3)  
 Lubricants - Industrial (PROC1, PROC10, PROC13, PROC17, PROC18, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, SU3)  
 Metal working fluids / rolling oils - Industrial (PROC1, PROC10, PROC13, PROC17, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, SU3)  
 Use as binders and release agents - Industrial (PROC1, PROC10, PROC13, PROC14, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8a, PROC8b, SU3)  
 Use as a fuel - Industrial (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU3)  
 Functional Fluids - Industrial (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU3)



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Rubber production and processing (PROC1, PROC13, PROC14, PROC15, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, SU10)  
Use in Coatings - Professional (PROC1, PROC10, PROC11, PROC13, PROC15, PROC19, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, SU22)  
Use in oil field drilling and production operations - Professional (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU22)  
Lubricants - Professional (Low Release) (PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU22)  
Lubricants - Professional (High Release) (PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU22)  
Use as binders and release agents - Professional (PROC1, PROC10, PROC11, PROC14, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, SU22)  
Use as a fuel - Professional (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU22)  
Road and construction applications (PROC1, PROC10, PROC11, PROC13, PROC2, PROC8a, PROC8b, PROC9, SU22)  
Explosives manufacture & use (PROC1, PROC3, PROC5, PROC8a, PROC8b, SU22)  
Use as a fuel - Consumer (PC13, SU21)

**REFERENCES:** Sources of information used in preparing this SDS included one or more of the following: results from in house or supplier toxicology studies, CONCAWE Product Dossiers, publications from other trade associations, such as the EU Hydrocarbon Solvents REACH Consortium, U.S. HPV Program Robust Summaries, the EU IUCLID Data Base, U.S. NTP publications, and other sources, as appropriate.

**List of abbreviations and acronyms that could be (but not necessarily are) used in this safety data sheet:**

Acronym	Full text
N/A	Not applicable
N/D	Not determined
NE	Not established
VOC	Volatile Organic Compound
AICS	Australian Inventory of Chemical Substances
AIHA WEEL	American Industrial Hygiene Association Workplace Environmental Exposure Limits
ASTM	ASTM International, originally known as the American Society for Testing and Materials (ASTM)
DSL	Domestic Substance List (Canada)
EINECS	European Inventory of Existing Commercial Substances
ELINCS	European List of Notified Chemical Substances
ENCS	Existing and new Chemical Substances (Japanese inventory)
IECSC	Inventory of Existing Chemical Substances in China
KECI	Korean Existing Chemicals Inventory
NDSL	Non-Domestic Substances List (Canada)
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances
TLV	Threshold Limit Value (American Conference of Governmental Industrial Hygienists)
TSCA	Toxic Substances Control Act (U.S. inventory)
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
LC	Lethal Concentration
LD	Lethal Dose
LL	Lethal Loading
EC	Effective Concentration
EL	Effective Loading
NOEC	No Observable Effect Concentration
NOELR	No Observable Effect Loading Rate

**KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):**

R20: Harmful by inhalation.  
R38: Irritating to skin.  
R40: Limited evidence of a carcinogenic effect.  
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
R65: Harmful: may cause lung damage if swallowed.

**KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):**

[Flam. Liq. 4 H227]: Combustible liquid; Flammable Liquid, Cat 4  
Asp. Tox. 1 H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1  
Skin Irrit. 2 H315: Causes skin irritation; Skin Corr/Irritation, Cat 2  
Acute Tox. 4 H332: Harmful if inhaled; Acute Tox Inh, Cat 4  
Carc. 2 H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2  
STOT RE 2 H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2  
[Aquatic Acute 2 H401]: Toxic to aquatic life; Acute Env Tox, Cat 2  
Aquatic Chronic 2 H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

Section 06: Protective Measures information was modified.  
Section 09: Density - Header information was modified.  
Section 05: Hazardous Combustion Products information was modified.  
Section 09: Relative Density - Header information was modified.  
Section 15: EU Inventory Requirements - Header information was modified.  
Section 14: Proper Shipping Name information was modified.  
Section 14: Transport Document Name information was modified.  
Section 14: Proper Shipping Name information was modified.  
Section 14: Transport Document Name information was modified.  
Section 08: Hand CEN Standards - EU information was modified.



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Section 11: Additional Health Information information was modified.  
Section 16: MSN, MAT ID information was modified.  
GHS Health Hazards information was modified.  
GHS Precautionary Statements - Disposal information was modified.  
GHS Precautionary Statements - Prevention information was modified.  
GHS Precautionary Statements - Response information was modified.  
GHS Precautionary Statements - Storage information was modified.  
dnel table - worker information was modified.  
dnel table - consumer information was modified.  
PNEC table information was modified.  
Composition: Component Table for REACH information was modified.  
Composition: Component Table information was modified.  
Section 12: Environmental tox table in section 12 information was modified.  
Section 12: Environmental fate table in section 12 information was modified.  
Section 01: Alternate Product Names Table information was modified.  
GHS Target Organ Phrase information was modified.  
Section 09: Flash Point °C(°F) information was modified.  
Section 09: Autoignition Temperature information was modified.  
Section 09: Boiling Point °C(°F) information was modified.  
Section 09: Vapour Pressure information was modified.  
Section 09: Viscosity information was modified.  
Section 01: Company Contact Methods information was modified.  
Section 04: First Aid Notes information was modified.  
Section 08: Exposure Limits Table information was modified.  
Section 01: Company Emergency Contact information was modified.  
Use in Coatings - Industrial: Section 1: Use Table information was modified.  
Use as binders and release agents - Industrial: Section 1: Use Table information was modified.  
Road and construction applications: Section 1: Use Table information was modified.  
Use as a fuel - Consumer: Annex Information information was modified.  
Use in Coatings - Professional: Annex Information information was modified.  
Use in Coatings - Industrial: Annex Information information was modified.  
Use as a fuel - Professional: Annex Information information was modified.  
Use as binders and release agents - Industrial: Annex Information information was modified.  
Use in oil field drilling and production operations - Industrial: Annex Information information was modified.  
Distribution of substance: Annex Information information was modified.  
Metal working fluids / rolling oils - Industrial: Annex Information information was modified.  
Use as binders and release agents - Professional: Annex Information information was modified.  
Road and construction applications: Annex Information information was modified.  
Lubricants - Professional (Low Release): Annex Information information was modified.  
Rubber production and processing: Annex Information information was modified.  
Formulation and (re)packing of substances and mixtures: Annex Information information was modified.  
Lubricants - Industrial: Annex Information information was modified.  
Lubricants - Professional (High Release): Annex Information information was modified.  
Use as a fuel - Industrial: Annex Information information was modified.  
Use in oil field drilling and production operations - Professional: Annex Information information was modified.  
Explosives manufacture & use: Annex Information information was modified.  
Functional Fluids - Industrial: Annex Information information was modified.  
Manufacture of substance: Annex Information information was modified.  
Use as an intermediate: Annex Information information was modified.

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Internal Use Only

MHC: 1A, 0B, 2, 0, 4, 1

PPEC: C

DGN: 7108741XGB (1018149)

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ANNEX

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Manufacture of substance	
<b>Use Descriptor</b>	
Sector(s) of Use	SU10, SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC1, ERC4
Specific Environmental Release Category	ESVOC 1.1.v1
<b>Processes, tasks, activities covered</b>	
Manufacture of the substance or use as an intermediate, process chemical or extracting agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (ncluding marine vessel/barge, road/rail car and bulk container).	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b>	
(only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>General exposures (closed systems) PROC1</b>	
No specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
Handle substance within a predominantly closed system provided with extract ventilation.	
<b>General exposures (open systems) PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>Process sampling PROC3</b>	
No other specific measures identified.	
<b>Laboratory activities PROC15</b>	
No other specific measures identified.	
<b>Bulk transfers (open systems) PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>(closed systems) Bulk transfers PROC8b</b>	
Handle substance within a closed system.	
Wear suitable gloves tested to EN374.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Drain down system prior to equipment break-in or maintenance.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Storage PROC2</b>	
Store substance within a closed system.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	
Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	
Annual site tonnage (tonnes/year): 600000 tons/yr	
Continuous release.	
Emission Days (days/year): 300 days/yr	

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<p>Fraction of EU tonnage used in region: 0.1          Fraction of Regional tonnage used Locally: 0.021          Maximum daily site tonnage (kg/d): 2000000 kg / day          Regional use tonnage (tonnes/year): 28000000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b></p>
<p>Local freshwater dilution factor [EF1] 10          Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b></p>
<p>Release fraction to air from process (initial release prior to RMM): 0.01          Release fraction to soil from process (initial release prior to RMM): 0.0001          Release fraction to wastewater from process (initial release prior to RMM): 3e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b></p>
<p>Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b></p>
<p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.          If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 %          Risk from environmental exposure is driven by freshwater sediment.          Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 %          Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 90.3 %</p>
<p><b>Organisation measures to prevent/limit release from site</b></p>
<p>Do not apply industrial sludge to natural soils.          Prevent discharge of undissolved substance to or recover from wastewater.          Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p>
<p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 10000 m3/day          Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 3300000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>During manufacturing no waste of the substance is generated [ETW4]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>During manufacturing no waste of the substance is generated [ERW2]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p>
<p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p>
<p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b></p>
<p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]          Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]          Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]          Risk Management Measures are based on qualitative risk characterisation. [G37]          Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b></p>
<p>Further details on scaling and control technologies are provided in factsheet          Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.          Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.066236          Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.606052          Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.          Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Distribution of substance	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6A, ERC6B, ERC6C, ERC6D, ERC7
Specific Environmental Release Category	ESVOC 1.1b.v1
<b>Processes, tasks, activities covered</b>	
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.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (skin irritants)</b>	
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.	
<b>General exposures (closed systems) PROC1</b>	
No specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
Handle substance within a closed system.	
<b>General exposures (closed systems) PROC3</b>	
Handle substance within a closed system.	
<b>General exposures (open systems) PROC4</b>	
Ensure material transfers are under containment or extract ventilation.	
Clear transfer lines prior to de-coupling.	
<b>Process sampling PROC3</b>	
No specific measures identified.	
<b>Laboratory activities PROC15</b>	
No specific measures identified.	
<b>Bulk transfers (closed systems) PROC8b</b>	
Handle substance within a closed system.	
Wear suitable gloves tested to EN374.	
<b>Bulk transfers (open systems) PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Drum and small package filling PROC9</b>	
Wear suitable gloves tested to EN374.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Drain down system prior to equipment break-in or maintenance.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Storage PROC2</b>	
Store substance within a closed system.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	



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<p>Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b></p> <p>Annual site tonnage (tonnes/year): 56000 tons/yr Continuous release. Emission Days (days/year): 300 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.002 Maximum daily site tonnage (kg/d): 190000 kg / day Regional use tonnage (tonnes/year): 28000000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b></p> <p>Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b></p> <p>Release fraction to air from process (initial release prior to RMM): 0.001 Release fraction to soil from process (initial release prior to RMM): 1e-005 Release fraction to wastewater from process (initial release prior to RMM): 1e-006</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b></p> <p>Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b></p> <p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b></p> <p>Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p> <p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 2900000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p> <p>Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8] The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p> <p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b></p> <p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b></p> <p>Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.059889 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.06518 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>



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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as an intermediate	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC6A
Specific Environmental Release Category	ESVOC 6.1a.v1
<b>Processes, tasks, activities covered</b>	
Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (skin irritants)</b>	
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.	
<b>General exposures (closed systems) PROC1</b>	
No specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
Handle substance within a predominantly closed system provided with extract ventilation.	
<b>General exposures (closed systems) PROC3</b>	
No specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>Process sampling PROC3</b>	
No specific measures identified.	
<b>Laboratory activities PROC15</b>	
No specific measures identified.	
<b>Bulk transfers (open systems) PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Bulk transfers (closed systems) PROC8b</b>	
Handle substance within a closed system.	
Wear suitable gloves tested to EN374.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Drain down system prior to equipment break-in or maintenance.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Bulk product storage PROC1</b>	
Store substance within a closed system.	
<b>Bulk product storage PROC2</b>	
Store substance within a closed system.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	
Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	

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<p>Annual site tonnage (tonnes/year): 15000 tons/yr            Continuous release.            Emission Days (days/year): 300 days/yr            Fraction of EU tonnage used in region: 0.1            Fraction of Regional tonnage used Locally: 0.043            Maximum daily site tonnage (kg/d): 50000 kg / day            Regional use tonnage (tonnes/year): 350000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b></p>
<p>Local freshwater dilution factor [EF1] 10            Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b></p>
<p>Release fraction to air from process (initial release prior to RMM): 0.001            Release fraction to soil from process (initial release prior to RMM): 0.001            Release fraction to wastewater from process (initial release prior to RMM): 3e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b></p>
<p>Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b></p>
<p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.            If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 %            Risk from environmental exposure is driven by freshwater sediment.            Treat air emissions to provide a typical removal (or abatement?) efficiency of: 80 %            Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 51.6 %</p>
<p><b>Organisation measures to prevent/limit release from site</b></p>
<p>Do not apply industrial sludge to natural soils.            Prevent discharge of undissolved substance to or recover from wastewater.            Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p>
<p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day            Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %            The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 410000 kg / day            Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>This substance is consumed during use and no waste of the substance is generated [ETW5]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>This substance is consumed during use and no waste of the substance is generated [ERW3]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p>
<p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p>
<p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b></p>
<p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]            Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]            Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]            Risk Management Measures are based on qualitative risk characterisation. [G37]            Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b></p>
<p>Further details on scaling and control technologies are provided in factsheet            Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.            Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.060476            Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.121587            Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.            Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Formulation and (re)packing of substances and mixtures	
<b>Use Descriptor</b>	
Sector(s) of Use	SU10, SU3
Process Categories	PROC1, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC2
Specific Environmental Release Category	ESVOC 2.2.v1
<b>Processes, tasks, activities covered</b>	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General exposures (closed systems) PROC1</b> No specific measures identified.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC3</b> Handle substance within a closed system.</p> <p><b>General exposures (open systems) PROC4</b> Wear suitable gloves tested to EN374.</p> <p><b>Process sampling PROC3</b> No specific measures identified.</p> <p><b>Laboratory activities PROC15</b> No specific measures identified.</p> <p><b>Bulk transfers PROC8b</b> Handle substance within a closed system. Wear suitable gloves tested to EN374.</p> <p><b>Mixing operations (open systems) PROC5</b> Provide extract ventilation to points where emissions occur. or Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Manual Transfer from/pouring from containers PROC8a</b> Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Drum/batch transfers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC14</b> Wear suitable gloves tested to EN374.</p> <p><b>Drum and small package filling PROC9</b> Wear suitable gloves tested to EN374.</p> <p><b>Equipment cleaning and maintenance PROC8a</b></p>	

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<p>Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Storage PROC1</b> Store substance within a closed system.</p> <p><b>Storage PROC2</b> Store substance within a closed system.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b> Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b> Annual site tonnage (tonnes/year): 30000 tons/yr Continuous release. Emission Days (days/year): 300 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0011 Maximum daily site tonnage (kg/d): 100000 kg / day Regional use tonnage (tonnes/year): 28000000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b> Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b> Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): [OOC11] 0.01 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 2e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b> Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b> If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 % Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 59.9 %</p>
<p><b>Organisation measures to prevent/limit release from site</b> Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b> Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 680000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b> The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b> The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b> Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b> Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.061214 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.14684 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>
<p><b>Section 1 Exposure Scenario Title</b></p>

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<b>Title:</b>	
Use in Coatings - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC15, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.3a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General exposures (closed systems) with sample collection PROC1</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) with sample collection PROC2</b> Handle substance within a closed system.</p> <p><b>Film formation - force drying (50-100°C). stoving (&gt;100°C). UV/EB radiation curing PROC2</b> Handle substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p><b>Film formation - air drying PROC4</b> provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves tested to EN374.</p> <p><b>Preparation of material for application Mixing operations (open systems) PROC5</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Spraying (automatic/robotic) PROC7</b> Wear suitable gloves tested to EN374. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Spraying/fogging by manual application PROC7</b> Wear a respirator conforming to EN140 with Type A filter or better. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Ensure operatives are trained to minimise exposures. Handle all packages and containers carefully to minimise spills.</p> <p><b>Material transfers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Roller, spreader, flow application PROC10</b> Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p><b>Dipping, immersion and pouring PROC13</b> Wear suitable gloves tested to EN374.</p> <p><b>Laboratory activities PROC15</b> No specific measures identified.</p>	

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<p><b>Storage PROC1</b> Store substance within a closed system.</p> <p><b>Storage PROC2</b> Store substance within a closed system.</p> <p><b>Bulk transfers PROC8b</b> Wear suitable gloves tested to EN374. Handle substance within a closed system.</p> <p><b>Equipment cleaning and maintenance PROC8a</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Drain down system prior to equipment break-in or maintenance.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b> Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b> Annual site tonnage (tonnes/year): 8100 tons/yr Continuous release. Emission Days (days/year): 300 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 1 Maximum daily site tonnage (kg/d): 27000 kg / day Regional use tonnage (tonnes/year): 8100 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b> Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b> Release fraction to air from process (initial release prior to RMM): 0.98 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 7e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b> Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b> If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <math>\geq 0\%</math> Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of <math>\geq 58.2\%</math></p>
<p><b>Organisation measures to prevent/limit release from site</b> Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b> Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 140000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b> The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b> The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b> Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b> Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>



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Section 1 Exposure Scenario Title	
<b>Title:</b>	
Use in oil field drilling and production operations - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC4
Specific Environmental Release Category	
<b>Processes, tasks, activities covered</b>	
Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Filling / preparation of equipment from drums or containers PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Drilling mud (re-)formulation PROC3</b>	
No specific measures identified.	
<b>Drill floor operations PROC4</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Drill floor operations Operation of solids filtering equipment - vapour exposures PROC4</b>	
Provide the operation with a properly sited receiving hood.	
<b>Cleaning of solids filtering equipment PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Process sampling PROC3</b>	
No specific measures identified.	
<b>General exposures (closed systems) PROC1</b>	
Handle substance within a closed system.	
<b>Pouring from small containers PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>General exposures (open systems) PROC4</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Bulk transfers PROC1</b>	
Handle substance within a closed system.	
<b>Bulk transfers PROC2</b>	
Handle substance within a closed system.	
<b>Bulk transfers PROC3</b>	
Handle substance within a closed system.	
<b>Treatment and disposal of filtered solids PROC4</b>	
Provide extract ventilation to points where emissions occur.	
<b>General exposures (closed systems) PROC2</b>	
Handle substance within a closed system.	
<b>Storage PROC1</b>	



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Store substance within a closed system.
<b>Storage PROC2</b>
Store substance within a closed system.
<b>Section 2.2 Control of environmental exposure</b>
<b>Product characteristics</b>
Predominantly hydrophobic. Substance is complex UVCB.
<b>Duration, frequency and amount</b>
Annual site tonnage (tonnes/year): Not Applicable Emission Days (days/year): Not Applicable Fraction of EU tonnage used in region: 1 Fraction of Regional tonnage used Locally: Not Applicable Maximum daily site tonnage (kg/d): Not Applicable Regional use tonnage (tonnes/year): 7750 tons/yr
<b>Environmental factors not influenced by risk management</b>
Local marine water dilution factor: [EF2] Not Applicable
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from process (initial release prior to RMM): Not Applicable Release fraction to wastewater from process (initial release prior to RMM): Not Applicable
<b>Technical conditions and measures at process level (source) to prevent release</b>
Discharge to aquatic environment is restricted (see Section 4.2) [TCS2]
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: Not Applicable Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: Not Applicable
<b>Organisation measures to prevent/limit release from site</b>
Not applicable
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] Not Applicable Estimated substance removal from wastewater via domestic sewage treatment is: Not Applicable The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: Not Applicable Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: Not Applicable
<b>Conditions and measures related to external treatment of waste for disposal</b>
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
<b>Conditions and measures related to external recovery of waste</b>
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
Qualitative approach used to conclude safe use [EE8] Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment [EE7]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Discharge to aquatic environment is restricted by law and industry prohibits release [DSU9]

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Lubricants - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC17, PROC18, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4, ERC7
Specific Environmental Release Category	ESVOC 4.6a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General exposures (closed systems) PROC1</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC3</b> Handle substance within a closed system.</p> <p><b>General exposures (open systems) PROC4</b> Provide extract ventilation to points where emissions occur.</p> <p><b>Bulk transfers PROC8b</b> Handle substance within a closed system. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers PROC8a</b> Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Initial factory fill of equipment PROC9</b> Wear suitable gloves tested to EN374.</p> <p><b>Operation and lubrication of high energy open equipment PROC17</b> Restrict area of openings to equipment. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Operation and lubrication of high energy open equipment PROC18</b> Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Restrict area of openings to equipment.</p> <p><b>Roller application or brushing PROC10</b> Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p><b>Treatment by dipping and pouring PROC13</b> Wear suitable gloves tested to EN374.</p>	

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<p><b>Spraying PROC7</b>  Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.  Wear suitable gloves (tested to EN374), coverall and eye protection.</p> <p><b>Maintenance (of larger plant items) and machine set up PROC8b</b>  Wear suitable gloves tested to EN374.</p> <p><b>Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC8b</b>  Ensure material transfers are under containment or extract ventilation.  Provide extract ventilation to emission points when contact with warm (&gt; 50°C) lubricant is likely.  Wear suitable gloves tested to EN374.</p> <p><b>Maintenance of small items PROC8a</b>  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Remanufacture of reject articles PROC9</b>  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Storage PROC1</b>  Store substance within a closed system.</p> <p><b>Storage PROC2</b>  Store substance within a closed system.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b>  Predominantly hydrophobic.  Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b>  Annual site tonnage (tonnes/year): 100 tons/yr  Continuous release.  Emission Days (days/year): 20 days/yr  Fraction of EU tonnage used in region: 0.1  Fraction of Regional tonnage used Locally: 0.0036  Maximum daily site tonnage (kg/d): 5000 kg / day  Regional use tonnage (tonnes/year): 27000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b>  Local freshwater dilution factor [EF1] 10  Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b>  Release fraction to air from process (initial release prior to RMM): 0.005  Release fraction to soil from process (initial release prior to RMM): 0.001  Release fraction to wastewater from process (initial release prior to RMM): 3e-006</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b>  Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>  If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 %  No secondary wastewater treatment required.  Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).  Treat air emissions to provide a typical removal (or abatement?) efficiency of: 70 %  Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b>  Do not apply industrial sludge to natural soils.  Prevent discharge of undissolved substance to or recover from wastewater.  Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b>  Assumed domestic sewage treatment plant effluent flow is: [STP5] 2000 m3/day  Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %  The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 78000 kg / day  Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery of recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b>  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b>  The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. [EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b>  Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]  Available hazard data do not support the need for a DNEL to be established for other health effects. [G36]  Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]  Risk Management Measures are based on qualitative risk characterisation. [G37]</p>



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Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Metal working fluids / rolling oils - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC17, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.7a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use in formulated MWFs (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.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General exposures (closed systems) PROC1</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC3</b> Handle substance within a closed system.</p> <p><b>General exposures (open systems) PROC4</b> Provide extract ventilation to points where emissions occur.</p> <p><b>Bulk transfers PROC8b</b> Handle substance within a closed system. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers PROC5</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Filling / preparation of equipment from drums or containers PROC9</b> Wear suitable gloves tested to EN374.</p> <p><b>Metal machining operations PROC17</b> Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Treatment by dipping and pouring PROC13</b> Wear suitable gloves tested to EN374.</p> <p><b>Spraying PROC7</b> 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.</p> <p><b>Roller application or brushing PROC10</b> Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p>	

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<p><b>Automated metal rolling/forming Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC2</b> Handle substance within a closed system.</p> <p><b>Semi-automated metal rolling/forming Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC17</b> Provide extract ventilation to points where emissions occur.</p> <p><b>Semi-automated metal rolling/forming PROC4</b> Provide extract ventilation to points where emissions occur.</p> <p><b>Equipment cleaning and maintenance Dedicated facility PROC8b</b> 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.</p> <p><b>Equipment cleaning and maintenance Non-dedicated facility PROC8a</b> 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.</p> <p><b>Storage PROC1</b> Store substance within a closed system.</p> <p><b>Storage PROC2</b> Store substance within a closed system.</p> <p><b>Process sampling PROC3</b> No specific measures identified.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b> Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b> Annual site tonnage (tonnes/year): 100 tons/yr Continuous release. Emission Days (days/year): 20 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0097 Maximum daily site tonnage (kg/d): 5000 kg / day Regional use tonnage (tonnes/year): 10000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b> Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b> Release fraction to air from process (initial release prior to RMM): 0.02 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 3e-006</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b> Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b> If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Treat air emissions to provide a typical removal (or abatement?) efficiency of: 70 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b> Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b> Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 78000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b> External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p><b>Conditions and measures related to external recovery of waste</b> External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b> The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b> The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b> Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]</p>



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Risk Management Measures are based on qualitative risk characterisation. [G37]

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]

**4.2. Environment**

Further details on scaling and control technologies are provided in factsheet

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 air can be achieved using on-site technologies, either alone or in combination.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.



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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as binders and release agents - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC14, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8a, PROC8b
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.10a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>Material transfers PROC1</b> Handle substance within a closed system.</p> <p><b>Material transfers PROC2</b> Handle substance within a closed system.</p> <p><b>Material transfers PROC3</b> Handle substance within a closed system.</p> <p><b>Drum/batch transfers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Mixing operations (closed systems) PROC3</b> No specific measures identified.</p> <p><b>Mixing operations (open systems) PROC4</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Mold forming PROC14</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Casting operations (open systems) Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). Aerosol generation due to elevated process temperature PROC6</b> Wear suitable gloves tested to EN374. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Spraying Machine PROC7</b> Wear suitable gloves tested to EN374. Carry out in a vented booth or extracted enclosure. Minimise exposure by extracted full enclosure for the operation or equipment.</p> <p><b>Roller application or brushing PROC10</b> Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p><b>Spraying Manual PROC7</b> Wear a full face respirator conforming to EN140 with Type A filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.</p>	

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<p><b>Storage PROC1</b> Store substance within a closed system.</p> <p><b>Storage PROC2</b> Store substance within a closed system.</p> <p><b>Treatment by dipping and pouring PROC13</b> Wear suitable gloves tested to EN374.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b> Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b> Annual site tonnage (tonnes/year): 2500 tons/yr Continuous release. Emission Days (days/year): 100 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.18 Maximum daily site tonnage (kg/d): 25000 kg / day Regional use tonnage (tonnes/year): 14000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b> Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b> Release fraction to air from process (initial release prior to RMM): 1 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b> Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b> If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). Treat air emissions to provide a typical removal (or abatement?) efficiency of: 80 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b> Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b> Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 170000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b> The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b> The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorsk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b> Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b> Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as a fuel - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b
Environmental Release Categories	ERC7
Specific Environmental Release Category	ESVOC 7.12a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b>	
(only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Bulk transfers PROC8b</b>	
Wear suitable gloves tested to EN374.	
Handle substance within a closed system.	
<b>Drum/batch transfers PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Drain down system prior to equipment break-in or maintenance.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Vessel and container cleaning PROC8a</b>	
Apply vessel entry procedures including use of supplied compressed air.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Storage PROC2</b>	
Store substance within a closed system.	
<b>Use as a fuel PROC1</b>	
No specific measures identified.	
<b>Use as a fuel PROC2</b>	
No specific measures identified.	
<b>Use as a fuel (closed systems) PROC16</b>	
No specific measures identified.	
<b>Use as a fuel (closed systems) PROC3</b>	
No specific measures identified.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	
Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	
Annual site tonnage (tonnes/year): 1500000 tons/yr	
Continuous release.	

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<p>Emission Days (days/year): 300 days/yr          Fraction of EU tonnage used in region: 0.1          Fraction of Regional tonnage used Locally: 0.34          Maximum daily site tonnage (kg/d): 5000000 kg / day          Regional use tonnage (tonnes/year): 4500000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b></p> <p>Local freshwater dilution factor [EF1] 10          Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b></p> <p>Release fraction to air from process (initial release prior to RMM): 0.005          Release fraction to soil from process (initial release prior to RMM): 0          Release fraction to wastewater from process (initial release prior to RMM): 1e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b></p> <p>Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b></p> <p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.          If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 60.4 %          Risk from environmental exposure is driven by          Treat air emissions to provide a typical removal (or abatement?) efficiency of: 95 %          Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 97.7 %</p>
<p><b>Organisation measures to prevent/limit release from site</b></p> <p>Do not apply industrial sludge to natural soils.          Prevent discharge of undissolved substance to or recover from wastewater.          Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p> <p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day          Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 5000000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 97.7 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p> <p>Combustion emissions considered in regional exposure assessment [ETW2]          Combustion emissions limited by required exhaust emission controls [ETW1]</p>
<p>Conditions and measures related to external recovery of waste</p> <p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p> <p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p> <p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b></p> <p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]          Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]          Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]          Risk Management Measures are based on qualitative risk characterisation. [G37]          Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b></p> <p>Further details on scaling and control technologies are provided in factsheet          Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.          Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.068551          Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.909091          Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.          Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Functional Fluids - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC7
Specific Environmental Release Category	ESVOC 7.13a.v1
<b>Processes, tasks, activities covered</b>	
Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Bulk transfers (closed systems) PROC1</b>	
No specific measures identified.	
<b>Bulk transfers (closed systems) PROC2</b>	
No specific measures identified.	
<b>Drum/batch transfers PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Filling of articles/equipment (closed systems) PROC9</b>	
Transfer via enclosed lines	
<b>Filling / preparation of equipment from drums or containers PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>General exposures (closed systems) PROC2</b>	
Ensure operatives are trained to minimise exposures.	
<b>General exposures (open systems) PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>General exposures (open systems) Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC4</b>	
Use dry break couplings for material transfer.	
<b>Remanufacture of reject articles PROC9</b>	
Wear suitable gloves tested to EN374.	
<b>Equipment maintenance PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Storage PROC2</b>	
Store substance within a closed system.	
<b>Bulk transfers (closed systems) PROC3</b>	
No specific measures identified.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	

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Substance is complex UVCB.
<b>Duration, frequency and amount</b>
Annual site tonnage (tonnes/year): 10 tons/yr Continuous release. Emission Days (days/year): 20 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0016 Maximum daily site tonnage (kg/d): 500 kg / day Regional use tonnage (tonnes/year): 6400 tons/yr
<b>Environmental factors not influenced by risk management</b>
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from process (initial release prior to RMM): 0.005 Release fraction to soil from process (initial release prior to RMM): 0.001 Release fraction to wastewater from process (initial release prior to RMM): 3e-006
<b>Technical conditions and measures at process level (source) to prevent release</b>
Common practices vary across sites thus conservative process release estimates used.
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
<b>Organisation measures to prevent/limit release from site</b>
Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 7800 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %
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 [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.



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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Rubber production and processing	
<b>Use Descriptor</b>	
Sector(s) of Use	SU10
Process Categories	PROC1, PROC13, PROC14, PROC15, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC1, ERC4, ERC6D
Specific Environmental Release Category	ESVOC 4.19.v1
<b>Processes, tasks, activities covered</b>	
Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b>	
(only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Material transfers PROC8b</b>	
Wear suitable gloves tested to EN374. OR Use dry break couplings for material transfer.	
<b>Bulk weighing PROC1</b>	
Wear suitable gloves tested to EN374. No other specific measures identified.	
<b>Bulk weighing PROC2</b>	
Wear suitable gloves tested to EN374. No other specific measures identified.	
<b>Small scale weighing PROC9</b>	
Wear suitable gloves tested to EN374.	
<b>Additive premixing PROC3</b>	
Wear suitable gloves tested to EN374.	
<b>Additive premixing PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>Additive premixing PROC5</b>	
Wear suitable gloves tested to EN374.	
<b>Material transfers PROC9</b>	
Use dry break couplings for material transfer.	
<b>Calendering (including Banburys) PROC6</b>	
Handle substance within a predominantly closed system provided with extract ventilation. or Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
<b>Pressing uncured rubber blanks PROC14</b>	
Wear suitable gloves tested to EN374.	



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<p><b>Tyre build up PROC7</b>  Minimise exposure by extracted full enclosure for the operation or equipment.  Wear suitable gloves (tested to EN374), coverall and eye protection.</p> <p><b>Vulcanisation PROC6</b>  Provide extract ventilation to material transfer points and other openings.</p> <p><b>Cooling cured articles PROC6</b>  Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Production of articles by dipping and pouring PROC13</b>  Wear suitable gloves tested to EN374.</p> <p><b>Finishing operations PROC21</b>  Wear suitable gloves tested to EN374.</p> <p><b>Laboratory activities PROC15</b>  No specific measures identified.</p> <p><b>Equipment maintenance PROC8a</b>  Drain down system prior to equipment break-in or maintenance.  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Storage PROC1</b>  Store substance within a closed system.</p> <p><b>Storage PROC2</b>  Store substance within a closed system.</p> <p><b>Bulk transfers (closed systems) PROC1</b>  No specific measures identified.</p> <p><b>Bulk transfers (closed systems) PROC2</b>  No specific measures identified.</p> <p><b>Bulk transfers PROC8b</b>  Wear suitable gloves tested to EN374.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b>  Predominantly hydrophobic.  Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b>  Annual site tonnage (tonnes/year): 16000 tons/yr  Continuous release.  Emission Days (days/year): 300 days/yr  Fraction of EU tonnage used in region: 0.1  Fraction of Regional tonnage used Locally: 1  Maximum daily site tonnage (kg/d): 52000 kg / day  Regional use tonnage (tonnes/year): 16000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b>  Local freshwater dilution factor [EF1] 10  Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b>  Release fraction to air from process (initial release prior to RMM): 0.01  Release fraction to soil from process (initial release prior to RMM): 0.0001  Release fraction to wastewater from process (initial release prior to RMM): 3e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b>  Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>  If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.  If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 %  Risk from environmental exposure is driven by freshwater sediment.  Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 %  Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 52.8 %</p>
<p><b>Organisation measures to prevent/limit release from site</b>  Do not apply industrial sludge to natural soils.  Prevent discharge of undissolved substance to or recover from wastewater.  Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b>  Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day  Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %  The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 420000 kg / day  Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p>
<p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>



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<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.060767 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.124596 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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Section 1 Exposure Scenario Title	
<b>Title:</b>	
Use in Coatings - Professional	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC15, PROC19, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.3b.v1
<b>Processes, tasks, activities covered</b>	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation) and equipment cleaning, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>GES03.02.00A G19 PROC1 [HEATING OIL]</b>	
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.	
<b>General exposures (closed systems) PROC1</b>	
Handle substance within a closed system.	
<b>General exposures (closed systems) Use in contained systems PROC2</b>	
Handle substance within a closed system.	
<b>Preparation of material for application PROC3</b>	
No specific measures identified.	
<b>Film formation - air drying Outdoor. PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>Film formation - air drying Indoor PROC4</b>	
Wear suitable gloves tested to EN374.	
<b>Preparation of material for application Indoor PROC5</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Preparation of material for application Outdoor. PROC5</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Material transfers Drum/batch transfers PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Roller, spreader, flow application Indoor PROC10</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Limit the substance content in the mixture to 25 %.	
<b>Roller, spreader, flow application Outdoor. PROC10</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Limit the substance content in the mixture to 25 %.	
<b>Manual Spraying Indoor PROC11</b>	
Carry out in a vented booth or extracted enclosure.	
provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Wear suitable gloves tested to EN374.	

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<p>Limit the substance content in the mixture to 25 %.</p> <p><b>Manual Spraying Outdoor. PROC11</b>            Wear a respirator conforming to EN140 with Type A/P2 filter or better.            Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.            Limit the substance content in the mixture to 25 %.            Avoid carrying out activities involving exposure for more than 4 hours.            Ensure operatives are trained to minimise exposures.</p> <p><b>Dipping, immersion and pouring Indoor PROC13</b>            Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Dipping, immersion and pouring Outdoor. PROC13</b>            Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Laboratory activities PROC15</b>            No other specific measures identified.</p> <p><b>Hand application - finger paints, pastels, adhesives Indoor PROC19</b>            Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.            Limit the substance content in the mixture to 5 %.</p> <p><b>Hand application - finger paints, pastels, adhesives Outdoor. PROC19</b>            Limit the substance content in the mixture to 5 %.            Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p><b>Filling / preparation of equipment from drums or containers PROC8b</b>            Wear suitable gloves tested to EN374.</p> <p><b>Storage PROC1</b>            Store substance within a closed system.</p> <p><b>Equipment cleaning and maintenance PROC8a</b>            Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.            Drain down system prior to equipment break-in or maintenance.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b>            Predominantly hydrophobic.            Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b>            Annual site tonnage (tonnes/year): 1.2 tons/yr            Continuous release.            Emission Days (days/year): 365 days/yr            Fraction of EU tonnage used in region: 0.1            Fraction of Regional tonnage used Locally: 0.0005            Maximum daily site tonnage (kg/d): 3.2 kg / day            Regional use tonnage (tonnes/year): 2300</p>
<p><b>Environmental factors not influenced by risk management</b>            Local freshwater dilution factor [EF1] 10            Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b>            Release fraction to air from process (initial release prior to RMM): 0.98            Release fraction to soil from process (initial release prior to RMM): 0.01            Release fraction to wastewater from process (initial release prior to RMM): 0.01</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b>            Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>            If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 %            No secondary wastewater treatment required.            Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).            Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable            Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b>            Do not apply industrial sludge to natural soils.            Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b>            Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day            Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %            The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 50 kg / day            Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b>            The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p>



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The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use in oil field drilling and production operations - Professional	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC8D
Specific Environmental Release Category	ESVOC 8.5b.v1
<b>Processes, tasks, activities covered</b>	
Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>Bulk transfers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Drilling mud (re-)formulation PROC3</b> No specific measures identified.</p> <p><b>Drill floor operations PROC4</b> No specific measures identified.</p> <p><b>Operation of solids filtering equipment - vapour exposures PROC4</b> Provide the operation with a properly sited receiving hood.</p> <p><b>Treatment and disposal of filtered solids PROC4</b> Provide extract ventilation to points where emissions occur.</p> <p><b>Cleaning of solids filtering equipment PROC8a</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>Process sampling PROC3</b> No specific measures identified.</p> <p><b>General exposures (closed systems) PROC1</b> Handle substance within a closed system.</p> <p><b>Pouring from small containers PROC8a</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>General exposures (open systems) PROC4</b> Wear suitable gloves tested to EN374.</p> <p><b>Equipment cleaning and maintenance PROC8a</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Batch process PROC2</b> Ensure operation is undertaken outdoors.</p> <p><b>Storage PROC1</b> Handle substance within a closed system.</p>	



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<p><b>Storage PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC1</b> Ensure operation is undertaken outdoors.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b> Predominantly hydrophobic. Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b> Fraction of EU tonnage used in region: 0.1 Regional use tonnage (tonnes/year): 7750 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b> Not applicable</p>
<p><b>Other given operational conditions affecting environmental exposure</b> Not applicable</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b> Discharge to aquatic environment is restricted (see Section 4.2) [TCS2]</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b> Not applicable</p>
<p><b>Organisation measures to prevent/limit release from site</b> Not applicable</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b> Not applicable</p>
<p>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 [ETW3]</p>
<p>Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b> The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b> Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment [EE7]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b> Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects. [G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]</p>
<p><b>4.2. Environment</b> Discharge to aquatic environment is restricted by law and industry prohibits release [DSU9]</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Lubricants - Professional (Low Release)	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.6b.v1
<b>Processes, tasks, activities covered</b>	
Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General exposures (closed systems) PROC1</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC3</b> Handle substance within a closed system.</p> <p><b>Operation of equipment containing engine oils and similar PROC20</b> No specific measures identified.</p> <p><b>General exposures (open systems) PROC4</b> Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear suitable gloves tested to EN374.</p> <p><b>Bulk transfers PROC8b</b> Avoid carrying out operation for more than 4 hours. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers Dedicated facility PROC8b</b> Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a</b> Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Operation and lubrication of high energy open equipment Indoor PROC17</b> 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).</p> <p><b>Operation and lubrication of high energy open equipment Indoor PROC18</b> 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).</p> <p><b>Operation and lubrication of high energy open equipment Outdoor. PROC17</b></p>	

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<p>Ensure operation is undertaken outdoors.  Limit the substance content in the mixture to 25 %.  Wear suitable gloves tested to EN374.  Ensure operatives are trained to minimise exposures.  Avoid carrying out operation for more than 4 hours.  <b>Maintenance (of larger plant items) and machine set up PROC8b</b>  Wear suitable gloves tested to EN374.  <b>Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC8b</b>  Provide extract ventilation to emission points when contact with warm (&gt; 50°C) lubricant is likely.  Wear suitable gloves tested to EN374.  <b>Maintenance of small items Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC8a</b>  Drain or remove substance from equipment prior to break-in or maintenance.  provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  <b>Engine lubricant service PROC9</b>  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  <b>Roller application or brushing PROC10</b>  Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  <b>Spraying PROC11</b>  Carry out in a vented booth or extracted enclosure.  Wear suitable gloves tested to EN374.  provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  Ensure operatives are trained to minimise exposures.  or  Limit the substance content in the mixture to 25 %.  Wear a respirator conforming to EN140 with Type A filter or better.  Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  Wear suitable coveralls to prevent exposure to the skin.  Wear a full face respirator conforming to EN140 with Type A filter or better.  Avoid carrying out activities involving exposure for more than 4 hours.  If above technical/organisational control measures are not feasible, then adopt following PPE:  <b>Treatment by dipping and pouring PROC13</b>  Wear suitable gloves tested to EN374.  <b>Storage PROC1</b>  Store substance within a closed system.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b>  Predominantly hydrophobic.  Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b>  Annual site tonnage (tonnes/year): 1.6 tons/yr  Continuous release.  Emission Days (days/year): 365 days/yr  Fraction of EU tonnage used in region: 0.1  Fraction of Regional tonnage used Locally: 0.0005  Maximum daily site tonnage (kg/d): 4.4 kg / day  Regional use tonnage (tonnes/year): 3200 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b>  Local freshwater dilution factor [EF1] 10  Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b>  Release fraction to air from process (initial release prior to RMM): 0.01  Release fraction to soil from process (initial release prior to RMM): 0.01  Release fraction to wastewater from process (initial release prior to RMM): 0.01</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b>  Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>  If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 %  No secondary wastewater treatment required.  Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).  Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable  Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b>  Do not apply industrial sludge to natural soils.  Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b>  Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day  Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %</p>

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The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 68 kg / day
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %
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 [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]
Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]
Risk Management Measures are based on qualitative risk characterisation. [G37]
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.059825
Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.064173
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Lubricants - Professional (High Release)	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.6c.v1
<b>Processes, tasks, activities covered</b>	
Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>General exposures (closed systems) PROC1</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC2</b> Handle substance within a closed system.</p> <p><b>General exposures (closed systems) PROC3</b> Handle substance within a closed system.</p> <p><b>Operation of equipment containing engine oils and similar PROC20</b> No specific measures identified.</p> <p><b>General exposures (open systems) PROC4</b> Wear suitable gloves tested to EN374. Provide a good standard of controlled ventilation (10 to 15 air changes per hour).</p> <p><b>Bulk transfers PROC8b</b> Avoid carrying out operation for more than 4 hours. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers Dedicated facility PROC8b</b> Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.</p> <p><b>Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a</b> Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p><b>Operation and lubrication of high energy open equipment Indoor PROC17</b> 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).</p> <p><b>Operation and lubrication of high energy open equipment Indoor PROC18</b> 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).</p> <p><b>Operation and lubrication of high energy open equipment Outdoor. PROC17</b> Ensure operation is undertaken outdoors.</p>	

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<p>Avoid carrying out operation for more than 4 hours.  Limit the substance content in the mixture to 25 %.  Wear suitable gloves tested to EN374.  Ensure operatives are trained to minimise exposures.  <b>Maintenance (of larger plant items) and machine set up PROC8b</b>  Wear suitable gloves tested to EN374.  OR  Provide extract ventilation to emission points when contact with warm (&gt; 50°C) lubricant is likely.  Wear suitable gloves tested to EN374.  <b>Maintenance of small items PROC8a</b>  provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Drain or remove substance from equipment prior to break-in or maintenance.  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  <b>Engine lubricant service PROC9</b>  Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  <b>Roller application or brushing PROC10</b>  Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  <b>Spraying PROC11</b>  Carry out in a vented booth or extracted enclosure.  Wear suitable gloves tested to EN374.  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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  Ensure operatives are trained to minimise exposures.  or  If above technical/organisational control measures are not feasible, then adopt following PPE:  Limit the substance content in the mixture to 25 %.  Wear a respirator conforming to EN140 with Type A filter or better.  Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  Wear suitable coveralls to prevent exposure to the skin.  Avoid carrying out activities involving exposure for more than 4 hours.  Wear a full face respirator conforming to EN140 with Type A filter or better.  <b>Treatment by dipping and pouring PROC13</b>  Wear suitable gloves tested to EN374.  <b>Storage PROC1</b>  Store substance within a closed system.</p>
<b>Section 2.2 Control of environmental exposure</b>
<b>Product characteristics</b>
Predominantly hydrophobic. Substance is complex UVCB.
<b>Duration, frequency and amount</b>
Annual site tonnage (tonnes/year): 1.6 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 4.4 kg / day Regional use tonnage (tonnes/year): 3200 tons/yr
<b>Environmental factors not influenced by risk management</b>
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from process (initial release prior to RMM): 0.15 Release fraction to soil from process (initial release prior to RMM): 0.05 Release fraction to wastewater from process (initial release prior to RMM): 0.05
<b>Technical conditions and measures at process level (source) to prevent release</b>
Common practices vary across sites thus conservative process release estimates used.
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %
<b>Organisation measures to prevent/limit release from site</b>
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 68 kg / day



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Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %
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 [ETW3]
Conditions and measures related to external recovery of waste
External recovery or recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8] The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as binders and release agents - Professional	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC14, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.10b.v1
<b>Processes, tasks, activities covered</b>	
Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<p><b>General measures applicable to all activities</b> 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 clear 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.</p> <p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.</p> <p><b>General measures (skin irritants)</b> 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.</p> <p><b>Material transfers (closed systems) PROC1</b> No other specific measures identified.</p> <p><b>Material transfers (closed systems) PROC2</b> No other specific measures identified.</p> <p><b>Material transfers (closed systems) PROC3</b> No other specific measures identified.</p> <p><b>Drum/batch transfers PROC8b</b> Wear suitable gloves tested to EN374.</p> <p><b>Mixing operations (closed systems) PROC3</b> No other specific measures identified.</p> <p><b>Mixing operations (open systems) PROC4</b> Wear suitable gloves tested to EN374.</p> <p><b>Mold forming PROC14</b> Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.</p> <p><b>Casting operations (open systems) Operation is carried out at elevated temperature (&gt; 20°C above ambient temperature). PROC6</b> Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.</p> <p>or Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection.</p> <p><b>Roller application or brushing PROC10</b> Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p><b>Spraying Manual PROC11</b> 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.</p>	
OR	

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<p>Wear suitable gloves (tested to EN374), coverall and eye protection.          Ensure operatives are trained to minimise exposures.          Wear a full face respirator conforming to EN140 with Type A filter or better.</p> <p><b>Batch process Storage PROC1</b>          Store substance within a closed system.</p> <p><b>Equipment cleaning and maintenance PROC8a</b>          Drain down system prior to equipment break-in or maintenance.          Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p>
<p><b>Section 2.2 Control of environmental exposure</b></p>
<p><b>Product characteristics</b>          Predominantly hydrophobic.          Substance is complex UVCB.</p>
<p><b>Duration, frequency and amount</b>          Annual site tonnage (tonnes/year): 1.5 tons/yr          Continuous release.          Emission Days (days/year): 365 days/yr          Fraction of EU tonnage used in region: 0.1          Fraction of Regional tonnage used Locally: 0.0005          Maximum daily site tonnage (kg/d): 4 kg / day          Regional use tonnage (tonnes/year): 2900 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b>          Local freshwater dilution factor [EF1] 10          Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b>          Release fraction to air from process (initial release prior to RMM): 0.95          Release fraction to soil from process (initial release prior to RMM): 0.025          Release fraction to wastewater from process (initial release prior to RMM): 0.025</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b>          Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>          If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 %          No secondary wastewater treatment required.          Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).          Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable          Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b>          Do not apply industrial sludge to natural soils.          Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b>          Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day          Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 62 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b>          External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p><b>Conditions and measures related to external recovery of waste</b>          External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b>          The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b>          The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b>          Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]          Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]          Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]          Risk Management Measures are based on qualitative risk characterisation. [G37]          Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b>          Further details on scaling and control technologies are provided in factsheet          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 air can be achieved using on-site technologies, either alone or in combination.          Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as a fuel - Professional	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.12b.v1
<b>Processes, tasks, activities covered</b>	
Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Bulk transfers PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Drum/batch transfers PROC8b</b>	
Use drum pumps or carefully pour from container.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Equipment cleaning and maintenance PROC8a</b>	
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.	
<b>Vessel and container cleaning PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Use as a fuel (closed systems) PROC3</b>	
No specific measures identified.	
<b>Use as a fuel (closed systems) PROC16</b>	
provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
or	
Ensure operation is undertaken outdoors.	
<b>refuelling PROC8b</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Use as a fuel PROC1</b>	
No specific measures identified.	
<b>Use as a fuel PROC2</b>	
No specific measures identified.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	
Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	
Annual site tonnage (tonnes/year): 3300 tons/yr	

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<p>Continuous release.  Emission Days (days/year): 365 days/yr  Fraction of EU tonnage used in region: 0.1  Fraction of Regional tonnage used Locally: 0.0005  Maximum daily site tonnage (kg/d): 9200 kg / day  Regional use tonnage (tonnes/year): 6700000 tons/yr</p>
<p><b>Environmental factors not influenced by risk management</b></p>
<p>Local freshwater dilution factor [EF1] 10  Local marine water dilution factor: [EF2] 100</p>
<p><b>Other given operational conditions affecting environmental exposure</b></p>
<p>Release fraction to air from process (initial release prior to RMM): 0.0001  Release fraction to soil from process (initial release prior to RMM): 1e-005  Release fraction to wastewater from process (initial release prior to RMM): 1e-005</p>
<p><b>Technical conditions and measures at process level (source) to prevent release</b></p>
<p>Common practices vary across sites thus conservative process release estimates used.</p>
<p><b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b></p>
<p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: &gt;= 0 %  No secondary wastewater treatment required.  Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).  Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable  Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: &gt;= 0 %</p>
<p><b>Organisation measures to prevent/limit release from site</b></p>
<p>Do not apply industrial sludge to natural soils.  Prevent discharge of undissolved substance to or recover from wastewater.  Sludge should be incinerated, contained or reclaimed.</p>
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p>
<p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day  Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 %  The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 140000 kg / day  Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b></p>
<p>Combustion emissions considered in regional exposure assessment [ETW2]  Combustion emissions limited by required exhaust emission controls [ETW1]</p>
<p><b>Conditions and measures related to external recovery of waste</b></p>
<p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p><b>Section 3 Exposure Estimation</b></p>
<p><b>3.1. Health</b></p>
<p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p><b>3.2. Environment</b></p>
<p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p><b>Section 4 Guidance to check compliance with the Exposure Scenario</b></p>
<p><b>4.1. Health</b></p>
<p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]  Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]  Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]  Risk Management Measures are based on qualitative risk characterisation. [G37]  Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p><b>4.2. Environment</b></p>
<p>Further details on scaling and control technologies are provided in factsheet  Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.059858  Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.064206  Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Road and construction applications	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC2, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC8D, ERC8F
Specific Environmental Release Category	ESVOC 8.15.v1
<b>Processes, tasks, activities covered</b>	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading)	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (skin irritants)</b>	
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.	
<b>Drum/batch transfers Non-dedicated facility PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Drum/batch transfers Dedicated facility PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Roller application or brushing PROC10</b>	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	
<b>Spraying/fogging by machine application PROC11</b>	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Ensure operation is undertaken outdoors. Ensure operatives are trained to minimise exposures.	
<b>Dipping, immersion and pouring PROC13</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Drain down system prior to equipment break-in or maintenance.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic. Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	
Annual site tonnage (tonnes/year): 15 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 42 kg / day Regional use tonnage (tonnes/year): 31000 tons/yr	



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<b>Environmental factors not influenced by risk management</b>
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from process (initial release prior to RMM): 0.95 Release fraction to soil from process (initial release prior to RMM): 0.04 Release fraction to wastewater from process (initial release prior to RMM): 0.01
<b>Technical conditions and measures at process level (source) to prevent release</b>
Common practices vary across sites thus conservative process release estimates used.
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 12.2 %
<b>Organisation measures to prevent/limit release from site</b>
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 620 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %
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 [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet 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 air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Explosives manufacture & use	
<b>Use Descriptor</b>	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC3, PROC5, PROC8a, PROC8b
Environmental Release Categories	ERC8E
Specific Environmental Release Category	
<b>Processes, tasks, activities covered</b>	
Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13 ]	
<b>Other given operational conditions affecting workers exposure</b>	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
Assumes use at not more than 20°C above ambient temperature[G15]	
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b>	
(only required controls to demonstrate safe use listed)	
<b>General measures applicable to all activities</b>	
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 clear 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.	
<b>General measures (Aspiration Hazard)</b>	
The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.	
Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting.	
<b>General measures (skin irritants)</b>	
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.	
<b>Bulk transfers PROC3</b>	
Handle substance within a closed system.	
<b>Drum/batch transfers PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Mixing operations (closed systems) PROC3</b>	
Handle substance within a closed system.	
<b>Mixing operations (open systems) PROC5</b>	
provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
or	
Ensure operation is undertaken outdoors.	
Wear suitable gloves tested to EN374.	
Avoid carrying out activities involving exposure for more than 4 hours.	
<b>Equipment maintenance PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Drain down system prior to equipment break-in or maintenance.	
<b>Storage PROC1</b>	
Store substance within a closed system.	
<b>Transfer from/pouring from containers Non-dedicated facility PROC8b</b>	
Wear suitable gloves tested to EN374.	
<b>Equipment cleaning and maintenance PROC8a</b>	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Predominantly hydrophobic.	
Substance is complex UVCB.	
<b>Duration, frequency and amount</b>	
Annual site tonnage (tonnes/year): 6.7 tons/yr	
Continuous release.	
Emission Days (days/year): 365 days/yr	
Fraction of EU tonnage used in region: 0.1	

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Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 18 kg / day Regional use tonnage (tonnes/year): 13000 tons/yr
<b>Environmental factors not influenced by risk management</b>
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from process (initial release prior to RMM): 0.001 Release fraction to soil from process (initial release prior to RMM): 0.01 Release fraction to wastewater from process (initial release prior to RMM): 0.02
<b>Technical conditions and measures at process level (source) to prevent release</b>
Common practices vary across sites thus conservative process release estimates used.
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq 0\%$ Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of $\geq 8.8\%$
<b>Organisation measures to prevent/limit release from site</b>
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 290 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.1 %
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 [ETW3]
Conditions and measures related to external recovery of waste
External recovery or recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.060048 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.064433 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

<b>Section 1 Exposure Scenario Title</b>	
<b>Title:</b>	
Use as a fuel - Consumer	
<b>Use Descriptor</b>	
Sector(s) of Use	SU21
Product Categories	PC13
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.12c.v1
<b>Processes, tasks, activities covered</b>	
Covers consumer uses in liquid fuels.	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of consumer exposure</b>	
<b>Product Characteristic</b>	
Liquid	
<b>Duration, frequency and amount</b>	
Not applicable	

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<b>Other given operational conditions affecting consumer exposure</b>
Not applicable
<b>Contributing Scenarios/Specific Risk Management Measures and Operating Conditions</b> (only required controls to demonstrate safe use listed)
<p><b>General measures (Aspiration Hazard)</b> The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children.</p> <p><b>Liquid: Automotive Refuelling PC13</b> Covers concentrations up to 100 % Covers use up to 1 times per day 52 days/yr Covers skin contact area up to 210 cm<sup>2</sup> For each use event, covers use amounts up to 37500 grams Covers outdoor use. 0.6 Air changes per hour Covers use in room size of 100 m<sup>3</sup> Covers exposure up to 0.05 hour(s) Liquid, vapour pressure &lt; 0,5 kPa at STP.</p> <p><b>Liquid, Garden Equipment - Use PC13</b> Covers concentrations up to 100 % Covers use up to 1 times per day 26 days/yr For each use event, covers use amounts up to 750 grams Covers outdoor use. 0.6 Air changes per hour Covers use in room size of 100 m<sup>3</sup> Covers exposure up to 2 hour(s) Liquid, vapour pressure &lt; 0,5 kPa at STP. Covers skin contact area up to 420 cm<sup>2</sup></p> <p><b>Liquid: Garden Equipment - Refueling PC13</b> Covers concentrations up to 100 % Covers use up to 26 days/yr 1 times per day Covers skin contact area up to 420 cm<sup>2</sup> For each use event, covers use amounts up to 750 grams Covers use in a one car garage (34 m<sup>3</sup>) under typical ventilation. 1.5 Air changes per hour Covers use in room size of 34 m<sup>3</sup> Covers exposure up to 0.03 hour(s) Liquid, vapour pressure &lt; 0,5 kPa at STP.</p>
<b>Section 2.2 Control of environmental exposure</b>
<b>Product characteristics</b>
Predominantly hydrophobic. Substance is complex UVCB.
<b>Duration, frequency and amount</b>
Annual site tonnage (tonnes/year): 8200 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 23000 kg / day Regional use tonnage (tonnes/year): 16000000 tons/yr
<b>Environmental factors not influenced by risk management</b>
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
<b>Other given operational conditions affecting environmental exposure</b>
Release fraction to air from wide dispersive use (regional only): 0.0001 Release fraction to soil from wide dispersive use (regional only): 1e-005 Release fraction to wastewater from wide dispersive use: 1e-005
<b>Conditions and measures related to municipal sewage treatment plant</b>
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m <sup>3</sup> /day Estimated substance removal from wastewater via domestic sewage treatment is: 94.1 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 350000 kg / day
Conditions and measures related to external treatment of waste for disposal
Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>



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The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
<b>4.2. Environment</b>
Further details on scaling and control technologies are provided in factsheet