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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 SDS meets the regulations in the United Kingdom excluding Northern Ireland.

### 1.1. PRODUCT IDENTIFIER

**Product Name:** VISOM 4  
**Product Description:** Severely Treated Base Oils  
**Product Code:** 301010302010, 408118, 710707-60

**Registration Name:**

Paraffin oils (petroleum), catalytic de-waxed light

**Identification Number:** (CAS #)64742-71-8

**Registration Number:**

01-2119485040-48-0004; 01-2119485040-48

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

**Intended Use:** Base oil

**Identified Uses:**

Manufacture of substance  
Distribution of substance  
Use as an intermediate  
Formulation and (re)packing of substances and mixtures  
Use in Cleaning Agents - Industrial  
Lubricants - Industrial  
Metal working fluids / rolling oils - Industrial  
Lubricants - Professional (Low Release)

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:** ExxonMobil Petroleum & Chemical BV  
POLDERDIJKWEG  
B-2030 Antwerpen  
Belgium

**Product Technical Information:**  
**Supplier General Contact:**  
**SDS Internet Address:**

(UK) 0800 028 2851  
(UK) 0800 028 2851  
[www.msds.exxonmobil.com](http://www.msds.exxonmobil.com)

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**E-Mail:** sds.uk@exxonmobil.com  
**Supplier / Registrant:** (BE) +32 3 790 3111

## 1.4. EMERGENCY TELEPHONE NUMBER

**24 Hour Emergency Telephone:** (UK) (+44) 870 8200418  
**National Poison Control Centre:** (UK) 111

## SECTION 2 HAZARDS IDENTIFICATION

### 2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

#### Classification according to CLP

Aspiration toxicant: Category 1., H304: May be fatal if swallowed and enters airways.

### 2.2. LABEL ELEMENTS

#### Label elements according to CLP

#### Pictograms:



**Signal Word:** Danger

#### Hazard Statements:

Health:  
H304: May be fatal if swallowed and enters airways.

#### Precautionary Statements:

Response:  
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P331: Do NOT induce vomiting.

Storage:  
P405: Store locked up.

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

**Contains:** Paraffin oils (petroleum), catalytic de-waxed light

### 2.3. OTHER HAZARDS

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**Physical / Chemical Hazards:**

No significant hazards.

**Health Hazards:**

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

**Environmental Hazards:**

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

<b>SECTION 3</b>	<b>COMPOSITION / INFORMATION ON INGREDIENTS</b>
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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
Paraffin oils (petroleum), catalytic de-waxed light	64742-71-8	265-176-5	01-2119485040-48	100 %	Asp. Tox. 1 H304

Note - any classification in brackets is a GHS building block that was not adopted in CLP and therefore is not applicable in the countries which have implemented CLP and is shown for informational purposes only.

Note: See SDS Section 16 for full text of hazard statements.

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

<b>SECTION 4</b>	<b>FIRST AID MEASURES</b>
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**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**

Wash contact areas with soap and water. 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.

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## INGESTION

Seek immediate medical attention. Do not induce vomiting.

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

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.

<b>SECTION 5</b>	<b>FIRE FIGHTING MEASURES</b>
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#### 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:** Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulphur oxides

#### 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.

## FLAMMABILITY PROPERTIES

**Flash Point [Method]:** >200°C (392°F) [ASTM D-92]

**Upper/Lower Flammable Limits (Approximate volume % in air):** UEL: 7.0 LEL: 0.9 [Estimated]

**Autoignition Temperature:** No data available

<b>SECTION 6</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
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### 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.

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For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor 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 hydrocarbons are recommended. 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:** Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

**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

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.

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

The type of container used to store the material may affect static accumulation and dissipation. Do not store in open or unlabelled containers.

### 7.3. SPECIFIC END USES

Section 1 informs about identified end-uses. No industrial or sector specific guidance available.

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<b>SECTION 8</b>	<b>EXPOSURE CONTROLS / PERSONAL PROTECTION</b>
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### 8.1. CONTROL PARAMETERS

#### EXPOSURE LIMIT VALUES

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

Substance Name	Form	Limit/Standard			Note	Source
Paraffin oils (petroleum), catalytic de-waxed light	Inhalable fraction.	TWA	5 mg/m <sup>3</sup>			ACGIH

**Exposure limits/standards for materials that can be formed when handling this product:** When mists/aerosols can occur the following is recommended: 5 mg/m<sup>3</sup> - ACGIH TLV (inhalable fraction).

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
Paraffin oils (petroleum), catalytic de-waxed light	NA	5.4 mg/m <sup>3</sup> DNEL, Chronic Exposure, Local Effects

##### Consumer

Substance Name	Dermal	Inhalation	Oral
Paraffin oils (petroleum), catalytic de-waxed light	NA	1.2 mg/m <sup>3</sup> DNEL, Chronic Exposure, Local Effects	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 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)
Paraffin oils (petroleum), catalytic	NA	NA	NA	NA	NA	NA	9.33 mg / kg (food)

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de-waxed light							
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## 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:

No special requirements under ordinary conditions of use and with adequate ventilation.

### 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:

No special requirements under ordinary conditions of use and with adequate ventilation.

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.

**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:

No protection is ordinarily required under normal conditions of use.

**Eye Protection:** If contact is likely, safety glasses with side shields 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:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

**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

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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:** Characteristic  
**Odour Threshold:** No data available  
**pH:** Not technically feasible  
**Melting Point:** Not technically feasible  
**Freezing Point:** No data available  
**Initial Boiling Point / and Boiling Range:** No data available  
**Flash Point [Method]:** >200°C (392°F) [ASTM D-92]  
**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: 0.9 [Estimated]  
**Vapour Pressure:** < 0.013 kPa (0.1 mm Hg) at 20 °C [Estimated]  
**Vapour Density (Air = 1):** > 2 at 101 kPa [Estimated]  
**Relative Density (at 15 °C):** 0.82 [ASTM D4052]  
**Solubility(ies): water** Negligible  
**Partition coefficient (n-Octanol/Water Partition Coefficient):** > 3.5 [Estimated]  
**Autoignition Temperature:** No data available  
**Decomposition Temperature:** No data available  
**Viscosity:** [N/D at 40°C] | 4 cSt (4 mm<sup>2</sup>/sec) at 100°C [ASTM D 445]  
**Explosive Properties:** None  
**Oxidizing Properties:** None

### 9.2. OTHER INFORMATION

**Pour Point:** -19°C (-2°F) [ASTM D97]  
**DMSO Extract (mineral oil only), IP-346:** < 3 %wt

## 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:** Excessive heat. High energy sources of ignition.

**10.5. INCOMPATIBLE MATERIALS:** Strong oxidisers



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

<b>SECTION 11</b>	<b>TOXICOLOGICAL INFORMATION</b>
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**11.1. INFORMATION ON TOXICOLOGICAL EFFECTS**

<b>Hazard Class</b>	<b>Conclusion / Remarks</b>
<b>Inhalation</b>	
Acute Toxicity: (Rat) LC50 > 5000 mg/m <sup>3</sup> 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 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
<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 402
Skin Corrosion/Irritation (Rabbit): Data available. Test scores or other study results do not meet criteria for classification.	Negligible irritation to skin at ambient temperatures. 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
<b>Aspiration:</b> Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
<b>Germ Cell Mutagenicity:</b> 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 471 473 474 476
<b>Carcinogenicity:</b> Data available. Test scores or other study results do not meet criteria for classification.	Not expected to cause cancer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 451 453
<b>Reproductive Toxicity:</b> Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 414 421
<b>Lactation:</b> No end point data for material.	Not expected to cause harm to breast-fed children.
<b>Specific Target Organ Toxicity (STOT)</b>	
Single Exposure: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to cause organ damage from a single exposure. Based on test data for structurally similar materials.
Repeated Exposure: Data available. Test scores or other study results do not meet	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials.

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criteria for classification.	Test(s) equivalent or similar to OECD Guideline 408 410 411 412 453
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## OTHER INFORMATION

### For the product itself:

Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

## SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

### 12.1. TOXICITY

Material -- Not expected to be harmful to aquatic organisms.

### 12.2. PERSISTENCE AND DEGRADABILITY

#### Biodegradation:

Material -- Expected to be inherently biodegradable

### 12.3. BIOACCUMULATIVE POTENTIAL

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

### 12.4. MOBILITY IN SOIL

Material -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

Material -- Low potential to migrate through soil.

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

Material does not meet the Reach Annex XIII criteria for PBT or vPvB.

### 12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

## ECOLOGICAL DATA

### Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL0 1000 - 10000 mg/l: data for similar materials
Aquatic - Acute Toxicity	96 hour(s)	Pimephales promelas	LL0 100 mg/l: data for similar materials
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella	EL0 100 mg/l: data for similar materials

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		subcapitata	
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 10 - 1000 mg/l: data for similar materials
Aquatic - Chronic Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 100 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. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

**European Waste Code:** 13 02 05\*

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 The Hazardous Waste Regulations (HWR), and subject to the provisions of those Regulations.

**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):** 14.1-14.6 Not Regulated for Land Transport

**INLAND WATERWAYS (ADN):** 14.1-14.6 Not Regulated for Inland Waterways Transport

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**SEA (IMDG): 14.1-14.6** Not Regulated for Sea Transport according to IMDG-Code

**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): 14.1-14.6** Not Regulated for Air Transport

## SECTION 15 REGULATORY INFORMATION

### REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AIIIC, DSL, ENCS, IECSC, ISHL, KECI, PICCS, TCSI, TSCA

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

##### Applicable UK legislation:

REACH [... Registration, Evaluation, Authorisation and Restriction of Chemicals ... and amendments thereto]

CLP [Classification, labelling and packaging of substances and mixtures.. and amendments thereto]

##### REACH Restrictions on the manufacturing, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII):

The following entries of Annex XVII may be considered for this product: None

#### 15.2. CHEMICAL SAFETY ASSESSMENT

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

## SECTION 16 OTHER INFORMATION

### 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 Cleaning Agents - Industrial (PROC1, PROC10, PROC13, PROC2, PROC3, PROC4, PROC7, PROC8a,

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PROC8bSU3, )

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)

Lubricants - Professional (Low Release) (PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU22)

**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:**

<b>Acronym</b>	<b>Full text</b>
N/A	Not applicable
N/D	Not determined
NE	Not established
VOC	Volatile Organic Compound
AiIC	Australian Inventory of Industrial Chemicals
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 H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):**

Asp. Tox. 1 H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1

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

CLP Classification information was added.

dnel table notes information was modified.

Formulation and (re)packing of substances and mixtures: Annex Information information was modified.

GHS Health Classification information was deleted.

GHS Health Hazards information was added.

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GHS Health Hazards information was deleted.  
GHS Health Symbol information was deleted.  
GHS Precautionary Statements - Disposal information was added.  
GHS Precautionary Statements - Disposal information was deleted.  
GHS Precautionary Statements - Response information was added.  
GHS Precautionary Statements - Response information was deleted.  
GHS Precautionary Statements - Storage information was added.  
GHS Precautionary Statements - Storage information was deleted.  
GHS Signal Word information was added.  
GHS Signal Word information was deleted.  
GHS Symbol information was added.  
GHS Target Organ Phrase information was deleted.  
Hazard Identification: Section 3 Footnotes for CLP tables information was modified.  
Lubricants - Industrial: Annex Information information was modified.  
Manufacture of substance: Annex Information information was modified.  
Section 01: Company Contact Methods information was modified.  
Section 01: Company Emergency Contact information was modified.  
Section 01: Company Mailing Address information was modified.  
Section 09: Flammable Limits - LEL information was modified.  
Section 09: Flammable Limits - UEL information was modified.  
Section 09: Pour Point °C(°F) information was modified.  
Section 09: Viscosity information was modified.  
Section 13: European Waste Code Hazardous Note information was modified.  
Section 15: EU Directives and Regulations information was modified.  
Section 15: National Chemical Inventory Listing information was modified.  
Section 15: REACH Annex XVII data information was added.

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Internal Use Only  
MHC: 2A, 0B, 0, 0, 0, 0

PPEC: A

DGN: 2027265XGB (1018781)

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Section 1 Exposure Scenario Title	
<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 (including marine vessel/barge, road/rail car and bulk container).	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Process sampling PROC3</b>	
No other specific measures identified.	
<b>Laboratory activities PROC15</b>	
No other specific measures identified.	
<b>Bulk transfers (closed systems) PROC8b</b>	
No other specific measures identified.	
<b>Bulk transfers (open systems) PROC8b</b>	
No other specific measures identified.	

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<p><b>Equipment cleaning and maintenance PROC8a</b>          Drain down system prior to equipment break-in or maintenance.</p> <p><b>Bulk product storage PROC1</b>          Store substance within a closed system.</p> <p><b>Bulk product 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): 600000 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): 2000000 kg / day          Regional use tonnage (tonnes/year): 850000 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): 0.0001          Release fraction to soil from process (initial release prior to RMM): 0.0001          Release fraction to wastewater from process (initial release prior to RMM): 0.00001</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          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;= 84.8 %</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] 10000 m3/day          Estimated substance removal from wastewater via domestic sewage treatment is: 94.7 %          Not applicable as there is no release to wastewater.          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 5700000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b>          During manufacturing no waste of the substance is generated [ETW4]</p>
<p><b>Conditions and measures related to external recovery of waste</b>          During manufacturing no waste of the substance is generated [ERW2]</p>
<p><b>Section 3 Exposure Estimation</b></p>



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### 3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]

### 3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]

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

### 4.1. Health

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]

### 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.

Scaled local assessments for European refineries have been performed using site-specific data and are attached in PETRORISK file - 'Site-Specific Production' worksheet. [DSU6]

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Section 1 Exposure Scenario Title	
<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 1.1.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.	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions	
(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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Process sampling PROC3</b>	
No other specific measures identified.	
<b>Laboratory activities PROC15</b>	
No other specific measures identified.	
<b>Bulk transfers (closed systems) PROC8b</b>	
No other specific measures identified.	
<b>Bulk transfers (open systems) PROC8b</b>	
No other specific measures identified.	

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<p><b>Drum and small package filling PROC9</b>          No other specific measures identified.</p> <p><b>Equipment cleaning and maintenance PROC8a</b>          Drain down system prior to equipment break-in or maintenance.</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): 1700 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: 0.002          Maximum daily site tonnage (kg/d): 17000 kg / day          Regional use tonnage (tonnes/year): 850000 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): 0.0001          Release fraction to soil from process (initial release prior to RMM): 0.00001          Release fraction to wastewater from process (initial release prior to RMM): 0.0000001</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          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;= 64.4 %</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: 94.7 %          Not applicable as there is no release to wastewater.          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 110000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %</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>

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<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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Section 1 Exposure Scenario Title	
<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 1.1.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).	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions	
(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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Process sampling PROC3</b>	
No other specific measures identified.	
<b>Laboratory activities PROC15</b>	
No other specific measures identified.	
<b>Bulk transfers (closed systems) PROC8b</b>	
No other specific measures identified.	
<b>Bulk transfers (open systems) PROC8b</b>	
No other specific measures identified.	

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<p><b>Equipment cleaning and maintenance PROC8a</b>          Drain down system prior to equipment break-in or maintenance.</p> <p><b>Bulk product storage PROC1</b>          Store substance within a closed system.</p> <p><b>Bulk product 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): 1500 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: 1          Maximum daily site tonnage (kg/d): 15000 kg / day          Regional use tonnage (tonnes/year): 1500 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): 0.00001          Release fraction to soil from process (initial release prior to RMM): 0.001          Release fraction to wastewater from process (initial release prior to RMM): 0.00001</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          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 =: &gt;= 66.2 %</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: 94.7 %          Not applicable as there is no release to wastewater.          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 98000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b>          This substance is consumed during use and no waste of the substance is generated [ETW5]</p>
<p><b>Conditions and measures related to external recovery of waste</b>          This substance is consumed during use and no waste of the substance is generated [ERW3]</p>
<p><b>Section 3 Exposure Estimation</b></p>

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<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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Section 1 Exposure Scenario Title	
<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 1.1.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.	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions	
(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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Batch processes at elevated temperatures Use in contained batch processes PROC3</b>	
No other specific measures identified.	
<b>Process sampling PROC3</b>	
No other specific measures identified.	
<b>Laboratory activities PROC15</b>	
No other specific measures identified.	
<b>Bulk transfers Dedicated facility PROC8b</b>	
No other specific measures identified.	



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<p><b>Mixing operations (open systems) PROC5</b>          No other specific measures identified.</p> <p><b>Manual Transfer from/pouring from containers Non-dedicated facility PROC8a</b>          No other specific measures identified.</p> <p><b>Drum/batch transfers Dedicated facility PROC8b</b>          No other specific measures identified.</p> <p><b>Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC14</b>          No other specific measures identified.</p> <p><b>Drum and small package filling PROC9</b>          No other specific measures identified.</p> <p><b>Equipment cleaning and maintenance PROC8a</b>          Drain down system prior to equipment break-in or maintenance.</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: 1          Maximum daily site tonnage (kg/d): 100000 kg / day          Regional use tonnage (tonnes/year): 850000 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 The Solvent Emissions Regulations requirements): [OOC11] 0.0025          Release fraction to soil from process (initial release prior to RMM): 0.0001          Release fraction to wastewater from process (initial release prior to RMM): 0.000005</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          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;= 69.5 %</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>

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<p><b>Conditions and measures related to municipal sewage treatment plant</b></p> <p>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: 94.7 %          Not applicable as there is no release to wastewater.          The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 570000 kg / day          Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b></p> <p>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></p> <p>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></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.          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 Cleaning Agents - Industrial	
<b>Use Descriptor</b>	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 1.1.v1 ,ESVOC 4.4a.v1
<b>Processes, tasks, activities covered</b>	
Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.	
Section 2 Operational conditions and risk management measures	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (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>Bulk transfers Dedicated facility PROC8b</b> No other specific measures identified.	
<b>Automated process with (semi) closed systems Use in contained systems PROC2</b> No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Dedicated facility PROC8b</b> No other specific measures identified.	
<b>Use in contained batch processes Automated process with (semi) closed systems Elevated temperature PROC3</b> No other specific measures identified.	
<b>Dipping, immersion and pouring PROC13</b> No other specific measures identified.	
<b>Cleaning with low-pressure washers PROC10</b> No other specific measures identified.	
<b>Cleaning with high pressure washers PROC7</b> Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	
<b>Manual Surfaces Cleaning No spraying PROC10</b>	

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No other specific measures identified.
<b>Equipment cleaning and maintenance PROC8a</b> Drain down system prior to equipment break-in or maintenance.
<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): 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: 1 Maximum daily site tonnage (kg/d): 5000 kg / day Regional use tonnage (tonnes/year): 10000 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): 1 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.0000001
<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 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 =: >= 64.4 %
<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: 94.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 33000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %
<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 and recycling of waste should comply with applicable local and/or national regulations [ERW1]

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<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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Section 1 Exposure Scenario Title	
<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 1.1.v1 ,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.	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (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 exposures (closed systems) PROC1</b> No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b> No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b> No other specific measures identified.	
<b>General exposures (open systems) PROC4</b> No other specific measures identified.	
<b>Bulk transfers Dedicated facility PROC8b</b> No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a</b> No other specific measures identified.	
<b>Initial factory fill of equipment PROC9</b> No other specific measures identified.	
<b>Operation and lubrication of high energy open equipment PROC17</b> Provide extract ventilation to points where emissions occur.	
<b>Manual Rolling, Brushing PROC10</b>	

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No other specific measures identified.
<b>Treatment by dipping and pouring PROC13</b>
No other specific measures identified.
<b>Spraying PROC7</b>
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
<b>Maintenance (of larger plant items) and machine set up Dedicated facility Elevated temperature PROC8b</b>
No other specific measures identified.
<b>Maintenance of small items Non-dedicated facility PROC8a</b>
No other specific measures identified.
<b>Remanufacture of reject articles PROC9</b>
No other specific measures identified.
<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): 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: 1 Maximum daily site tonnage (kg/d): 5000 kg / day Regional use tonnage (tonnes/year): 310000 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): 0.0005 Release fraction to soil from process (initial release prior to RMM): 0.001 Release fraction to wastewater from process (initial release prior to RMM): 0.000001
<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 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 =: >= 64.5 %
<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

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Estimated substance removal from wastewater via domestic sewage treatment is: 94.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 33000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %
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 and 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. Scaled local assessments for European refineries have been performed using site-specific data and are attached in PETRORISK file - 'Site-Specific Production' worksheet. [DSU6]



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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 1.1.v1 ,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] 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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Bulk transfers Dedicated facility PROC8b</b>	
No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Dedicated facility PROC8b</b>	
No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Dedicated facility PROC5</b>	
No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Dedicated facility PROC9</b>	
No other specific measures identified.	

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<p><b>Process sampling PROC3</b>          No other specific measures identified.</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>          No other specific measures identified.</p> <p><b>Spraying PROC7</b>          Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p><b>Manual Rolling, Brushing PROC10</b>          No other specific measures identified.</p> <p><b>Automated metal rolling/forming Use in contained systems Elevated temperature PROC2</b>          No other specific measures identified.</p> <p><b>Semi-automated metal rolling/forming Elevated temperature PROC17</b>          Provide extract ventilation to points where emissions occur.</p> <p><b>Semi-automated metal rolling/forming PROC4</b>          No other specific measures identified.</p> <p><b>Equipment cleaning and maintenance Dedicated facility PROC8b</b>          Drain down system prior to equipment break-in or maintenance.</p> <p><b>Equipment cleaning and maintenance Non-dedicated facility PROC8a</b>          Drain down system prior to equipment break-in or maintenance.</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: 1          Maximum daily site tonnage (kg/d): 5000 kg / day          Regional use tonnage (tonnes/year): 4200 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): 0.000001</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</p>

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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 =: >= 64.5 %
<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: 94.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 33000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %
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 and 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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Section 1 Exposure Scenario Title	
<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 1.1.v1 ,ESVOC 8.6c.v1 ,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.	
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] Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions	
(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 exposures (closed systems) PROC1</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC2</b>	
No other specific measures identified.	
<b>General exposures (closed systems) PROC3</b>	
No other specific measures identified.	
<b>Operation of equipment containing engine oils and similar (closed systems) PROC20</b>	
No other specific measures identified.	
<b>General exposures (open systems) PROC4</b>	
No other specific measures identified.	
<b>Bulk transfers Dedicated facility PROC8b</b>	
No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Dedicated facility PROC8b</b>	
No other specific measures identified.	
<b>Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a</b>	
Avoid carrying out activities involving exposure for more than 1 hour.	

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<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.</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.</p> <p><b>Operation and lubrication of high energy open equipment Outdoor. PROC17</b>          Ensure operation is undertaken outdoors.          Avoid carrying out operation for more than 4 hours.          Limit the substance content in the mixture to 25 %.</p> <p><b>Maintenance (of larger plant items) and machine set up Dedicated facility Elevated temperature PROC8b</b>          Drain down system prior to equipment break-in or maintenance.          Provide extract ventilation to emission points when contact with warm (&gt; 50°C) lubricant is likely.</p> <p><b>Maintenance of small items Non-dedicated facility Elevated 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).</p> <p><b>Engine lubricant service PROC9</b>          No other specific measures identified.</p> <p><b>Manual Rolling, Brushing PROC10</b>          No other specific measures identified.</p> <p><b>Spraying PROC11</b>          Carry out in a vented booth or extracted enclosure.          or          Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.          Avoid carrying out activities involving exposure for more than 1 hour.          OR          Wear a respirator conforming to EN140 with Type A filter or better.</p> <p><b>Treatment by dipping and pouring PROC13</b>          No other specific measures identified.</p> <p><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): 53 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: 1          Maximum daily site tonnage (kg/d): 365 kg / day          Regional use tonnage (tonnes/year): 110000 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 wide dispersive use (regional only): 0.01          Release fraction to soil from wide dispersive use (regional only): 0.01          Release fraction to wastewater from wide dispersive use: 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>

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<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.</p> <p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <math>\geq 0\%</math></p> <p>Risk from environmental exposure is driven by</p> <p>Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable</p> <p>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of <math>\geq 76.1\%</math></p>
<p><b>Organisation measures to prevent/limit release from site</b></p> <p>Do not apply industrial sludge to natural soils.</p> <p>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 m<sup>3</sup>/day</p> <p>Estimated substance removal from wastewater via domestic sewage treatment is: 94.7 %</p> <p>Not applicable as there is no release to wastewater.</p> <p>The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 650 kg / day</p> <p>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.7 %</p>
<p><b>Conditions and measures related to external treatment of waste for disposal</b></p> <p>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></p> <p>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></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]</p> <p>Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]</p> <p>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> <p>Risk Management Measures are based on qualitative risk characterisation. [G37]</p> <p>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</p> <p>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.</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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