SAFETY DATA SHEET

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

As of the revision date above, this SDS meets the regulations in the United Kingdom & Ireland.

1.1. PRODUCT IDENTIFIER

Product Name: VARSOL™ 40
Product Description: Aliphatic, Cycloparaffinic, Aromatic Hydrocarbons

Registration Name:
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)

Identification Number: (EC #)919-446-0

Registration Number:
01-2119458049-33-0004; 01-2119458049-33

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

Intended Use: Solvent

Identified Uses:
Manufacture of substance
Distribution of substance
Formulation and (re)packing of substances and mixtures
Use in Coatings - Industrial
Use in Cleaning Agents - Industrial
Lubricants - Industrial
Metal working fluids / rolling oils - Industrial
Use as a fuel - Industrial
Functional Fluids - Industrial
Use in laboratories - Industrial
Rubber production and processing
Polymer processing - Industrial
Water treatment chemicals - Industrial
Use in Coatings - Professional
Use in Cleaning Agents - Professional
Use in oil field drilling and production operations - Professional
Lubricants - Professional (Low Release)
Lubricants - Professional (High Release)
Metal working fluids / rolling oils - Professional
Agrochemical uses - Professional
Use as a fuel - Professional
Functional Fluids - Professional
Road and construction applications
Use in laboratories - Professional
Polymer processing - Professional

Water treatment chemicals - Professional
Use in Coatings - Consumer
Use in Cleaning Agents - Consumer
Lubricants - Consumer (Low Release)
Lubricants - Consumer (High Release)
Agrochemical uses - Consumer
Use as a fuel - Consumer
Functional Fluids - Consumer

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

Uses advised against: The above Identified Uses are specific to the customer for whom this Safety Data Sheet is intended and are uses for which the information in this Safety Data Sheet is applicable. Other uses for this product may be supported/registered. This product is not recommended for any industrial, professional or consumer use other than those which are supported/registered.

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Supplier: **ExxonMobil Petroleum & Chemical BVBA**
Polderdijkweg
B-2030 Antwerpen
Belgium
Phone: (BE) +32 3 543 31 11

Local Contact: **ExxonMobil Chemical Ltd.**
MAILPOINT 14
MARSH LANE
FAWLEY, SOUTHAMPTON
SO45 1TX HAMPSHIRE
Great Britain

Supplier General Contact: (UK) (+44) (0) 23 8089 3822
E-Mail: sds.uk@exxonmobil.com

1.4. EMERGENCY TELEPHONE NUMBER

24 Hour Emergency Telephone: +(44)-8708200418 (CHEMTREC)

SECTION 2 HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

Classification according to Regulation (EC) No 1272/2008
Flammable liquid: Category 3.
Specific target organ toxicant (central nervous system): Category 3. Specific target organ toxicant (repeated exposure): Category 1. Aspiration toxicant: Category 1.
Chronic aquatic toxicant: Category 2.
H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways. H336: May cause drowsiness or dizziness. H372: Causes damage to organs through prolonged or repeated exposure. Central Nervous system
H411: Toxic to aquatic life with long lasting effects.

2.2. LABEL ELEMENTS

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

Pictograms:

Signal Word: Danger

Hazard Statements:

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways. H336: May cause drowsiness or dizziness. H372: Causes damage to organs through prolonged or repeated exposure. Central Nervous system
H411: Toxic to aquatic life with long lasting effects.
EUH066: Repeated exposure may cause skin dryness or cracking.

Precautionary Statements:

P102: Keep out of reach of children.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233: Keep container tightly closed. P240: Ground and bond container and receiving equipment. P241: Use explosion-proof electrical, ventilating and lighting equipment. P242: Use non-sparking tools. P243: Take action to prevent static discharges. P260: Do not breathe mist / vapours. P264: Wash skin thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P280: Wear protective gloves and eye / face protection.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P331: Do NOT induce vomiting. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P391: Collect spillage.
P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.
P501: Dispose of contents and container in accordance with local regulations.

Contains: Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)

2.3. OTHER HAZARDS

Physical / Chemical Hazards:

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

Health Hazards:

May be irritating to the eyes, nose, throat, and lungs. Repeated exposure may cause skin dryness or cracking. May cause central nervous system depression.

Environmental Hazards:

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

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

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
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)		919-446-0	01-2119458049-33	100 %	[Aquatic Acute 2 H401], Aquatic Chronic 2 H411, Asp. Tox. 1 H304, EUH066, Flam. Liq. 3 H226, STOT SE 3 H336, STOT RE 1 H372

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

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Concentration values may vary.

Note: Any entry in the EC# column that begins with the number "9" is a Provisional List Number provided by ECHA pending publication of the official EC Inventory Number for the substance. See Section 15 for additional CAS number information for the substance.

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

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

SECTION 4 FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES

INHALATION

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

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT

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

INGESTION

Seek immediate medical attention. Do not induce vomiting.

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

Headache, dizziness, drowsiness, nausea and other CNS effects.

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.

SECTION 5 FIRE FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Suitable Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media: Straight streams of water

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Hazardous Combustion Products: Incomplete combustion products, Oxides of carbon, Smoke, Fume

5.3. ADVICE FOR FIRE FIGHTERS

Fire Fighting Instructions: FLAMMABLE. 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.

Unusual Fire Hazards: Flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger.

FLAMMABILITY PROPERTIES

Flash Point [Method]: 43°C (109°F) [ASTM D-56]
Upper/Lower Flammable Limits (Approximate volume % in air): UEL: 6.0 LEL: 0.7 [Extrapolated]
Autoignition Temperature: 242°C (468°F) [ASTM E659]

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

NOTIFICATION PROCEDURES

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

PROTECTIVE MEASURES

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

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H2S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

6.2. ENVIRONMENTAL PRECAUTIONS

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

6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

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

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. Warn other shipping. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

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

6.4. REFERENCES TO OTHER SECTIONS

See Sections 8 and 13.

SECTION 7 HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING

Avoid contact with skin. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Use only with adequate ventilation. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds 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).

Loading/Unloading Temperature: [Ambient]

Transport Temperature: [Ambient]
Transport Pressure: [Ambient]

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

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

The type of container used to store the material may affect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be earthed and bonded to prevent accumulation of static charge.
Storage Temperature: [Ambient]
Storage Pressure: [Ambient]

Suitable Containers/Packing: Tankers; Drums; Tank Cars; Tank Trucks; Barges; Railcars
Suitable Materials and Coatings (Chemical Compatibility): Carbon Steel; Stainless Steel; Polyester; Teflon; Polyethylene; Polypropylene
Unsuitable Materials and Coatings: Butyl Rubber; Polystyrene; Ethylene-proplyene-diene monomer (EPDM); Natural Rubber

7.3. SPECIFIC END USES

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

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

EXPOSURE LIMIT VALUES

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

Substance Name	Form	Limit/Standard			Note	Source
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	Vapour.	RCP - TWA	52 ppm	300 mg/m3	Total Hydrocarbons	ExxonMobil

Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)		TWA	100 ppm			ACGIH

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

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

Worker

Substance Name	Dermal	Inhalation
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	44 mg/kg bw/day DNEL, Chronic Exposure, Systemic Effects	330 mg/m3 DNEL, Chronic Exposure, Systemic Effects

Consumer

Substance Name	Dermal	Inhalation	Oral
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	26 mg/kg bw/day DNEL, Chronic Exposure, Systemic Effects	71 mg/m3 DNEL, Chronic Exposure, Systemic Effects	26 mg/kg bw/day DNEL, Chronic Exposure, Systemic Effects

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

PREDICTED NO EFFECT CONCENTRATION (PNEC)

Substance Name	Aqua (fresh water)	Aqua (marine water)	Aqua (intermittent release)	Sewage treatment plant	Sediment	Soil	Oral (secondary poisoning)
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	NA	NA	NA	NA	NA	NA	NA

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

8.2. EXPOSURE CONTROLS

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

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

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

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

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

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:

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

Eye Protection: If contact 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:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

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

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

ENVIRONMENTAL CONTROLS

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

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Form: Clear
Colour: Colorless to Yellow
Odour: Pungent petroleum
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: 155°C (311°F) - 194°C (381°F) [ASTM D86]
Flash Point [Method]: 43°C (109°F) [ASTM D-56]
Evaporation Rate (n-butyl acetate = 1): 0.2 [In-house method]
Flammability (Solid, Gas): Not technically feasible
Upper/Lower Flammable Limits (Approximate volume % in air): UEL: 6.0 LEL: 0.7 [Extrapolated]
Vapour Pressure: 0.2 kPa (1.5 mm Hg) at 20 °C [Calculated]
Vapour Density (Air = 1): 4.9 at 101 kPa [In-house method]
Relative Density (at 15 °C): 0.79 [With respect to water] [Calculated]
Solubility(ies): water Negligible
Partition coefficient (n-Octanol/Water Partition Coefficient): > 4 [Estimated]
Autoignition Temperature: 242°C (468°F) [ASTM E659]
Decomposition Temperature: No data available
Viscosity: 0.96 cSt (0.96 mm2/sec) at 40ºC | 1.26 cSt (1.26 mm2/sec) at 20°C [Calculated]
Explosive Properties: None
Oxidizing Properties: None

9.2. OTHER INFORMATION

Density (at 15 ºC): 790 kg/m3 (6.59 lbs/gal, 0.79 kg/dm3) [ISO 12185]
Pour Point: -73°C (-99°F) [ASTM D5950]
Molecular Weight: 143 G/MOLE [Calculated]
Hygroscopic: No
Coefficient of Thermal Expansion: 0.00096 per Deg C [Calculated]

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: Avoid heat, sparks, open flames and other ignition sources.

10.5. INCOMPATIBLE MATERIALS: Strong oxidisers

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

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 4 hour(s) LC50 > 13.1 mg/l (Vapour) Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity (Rat): LD50 > 15000 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
Skin	
Acute Toxicity (Rabbit): LD50 > 3400 ml/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: Data available. Test scores or other study results do not meet criteria for classification.	May dry the skin leading to discomfort and dermatitis. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation: 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
Sensitisation	
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 the material. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 474 475 479
Carcinogenicity: 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 453
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for

Test scores or other study results do not meet criteria for classification.	the material. Test(s) equivalent or similar to OECD Guideline 413 414 415
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	May cause drowsiness or dizziness.
Repeated Exposure: Data available.	Causes organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 408 411 413

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Central Nervous system

Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

SECTION 12 ECOLOGICAL INFORMATION

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

12.1. TOXICITY

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

12.2. PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be readily biodegradable.

Hydrolysis:

Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis:

Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation:

Material -- Expected to degrade rapidly in air

12.3. BIOACCUMULATIVE POTENTIAL Not determined.

12.4. MOBILITY IN SOIL

Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

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

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

12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL50 10-22 mg/l: data for the material
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LL50 10-30 mg/l: data for the material
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	EL50 4.6-10 mg/l: data for the material
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 1 mg/l: data for the material
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	LOEC 0.203 mg/l: data for the material
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOEC 0.097 mg/l: data for the material

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results: Basis
Water	Ready Biodegradability	28 day(s)	Percent Degraded 74.7

SECTION 13 DISPOSAL CONSIDERATIONS

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

13.1. WASTE TREATMENT METHODS

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

REGULATORY DISPOSAL INFORMATION

European Waste Code: 08 XX XX

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).

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE

SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADR/RID)

14.1. UN Number: 1300
14.2. UN Proper Shipping Name (Technical Name): TURPENTINE SUBSTITUTE
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Classification Code: F1
Label(s) / Mark(s): 3, EHS
Hazard ID Number: 30
Hazchem EAC: 3Y

INLAND WATERWAYS (ADNR/ADN)

14.1. UN (or ID) Number: 1300
14.2. UN Proper Shipping Name (Technical Name): TURPENTINE SUBSTITUTE
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Hazard ID Number: 30
Label(s) / Mark(s): 3 (N2, F), EHS

SEA (IMDG)

14.1. UN Number: 1300
14.2. UN Proper Shipping Name (Technical Name): TURPENTINE SUBSTITUTE
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Marine Pollutant
14.6. Special Precautions for users:
Label(s): 3
EMS Number: F-E, S-E
Transport Document Name: UN1300, TURPENTINE SUBSTITUTE, 3, PG III, (43°C c.c.), MARINE POLLUTANT

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

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Substance Name: NOXIOUS LIQUID, N.F.,(5) N.O.S., (VARSOL 40, contains alkyl (C3-C4) benzenes)
Ship type required: 2
Pollution category: Y

AIR (IATA)

14.1. UN Number: 1300
14.2. UN Proper Shipping Name (Technical Name): TURPENTINE SUBSTITUTE

14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Label(s) / Mark(s): 3
Transport Document Name: UN1300, TURPENTINE SUBSTITUTE, 3, PG III

SECTION 15 REGULATORY INFORMATION

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

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

The following substance(s) in this product is (are) identified by the CAS number(s) shown in countries not subject to the REACH regulation.

Name	CAS
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	64742-82-1

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

Applicable EU Directives and Regulations:

1907/2006 [... on the Registration, Evaluation, Authorisation and Restriction of Chemicals ... and amendments thereto]

2004/42/CE [on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC.]

96/82/EC as extended by 2003/105/EC [... on the control of major-accident hazards involving dangerous substances]. Product contains a substance that falls within the criteria defined in Annex I. Refer to Directive for details of requirements taking into account the volume of product stored on site.

98/24/EC [... on the protection of workers from the risk related to chemical agents at work ...]. Refer to Directive for details of requirements.

1272/2008 [on classification, labelling and packaging of substances and mixtures.. and amendments thereto]

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)
Formulation and (re)packing of substances and mixtures (PROC1, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, SU10, SU3)
Use in Coatings - Industrial (PROC1, PROC10, PROC13, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, SU3)
Use in Cleaning Agents - Industrial (PROC1, PROC10, PROC13, PROC2, PROC3, PROC4, PROC7, PROC8a, 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)
Use as a fuel - Industrial (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU3)
Functional Fluids - Industrial (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU3)
Use in laboratories - Industrial (PROC10, PROC15, SU3)
Rubber production and processing (PROC1, PROC13, PROC14, PROC15, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, SU10)
Polymer processing - Industrial (PROC1, PROC13, PROC14, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, SU10, SU3)
Water treatment chemicals - Industrial (PROC1, PROC13, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU3)
Use in Coatings - Professional (PROC1, PROC10, PROC11, PROC13, PROC15, PROC19, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, SU22)
Use in Cleaning Agents - Professional (PROC1, PROC10, PROC11, PROC13, PROC19, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU22)
Use in oil field drilling and production operations - Professional (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU22)
Lubricants - Professional (Low Release) (PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU22)
Lubricants - Professional (High Release) (PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU22)
Metal working fluids / rolling oils - Professional (PROC1, PROC10, PROC11, PROC13, PROC17, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, SU22)
Agrochemical uses - Professional (PROC1, PROC11, PROC13, PROC2, PROC4, PROC8a, PROC8b, SU22)
Use as a fuel - Professional (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU22)
Functional Fluids - Professional (PROC1, PROC2, PROC20, PROC3, PROC8a, PROC9, SU22)
Road and construction applications (PROC1, PROC10, PROC11, PROC13, PROC2, PROC8a, PROC8b, PROC9, SU22)
Use in laboratories - Professional (PROC10, PROC15, SU22)
Polymer processing - Professional (PROC1, PROC14, PROC2, PROC21, PROC6, PROC8a, PROC8b, SU22)
Water treatment chemicals - Professional (PROC1, PROC13, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU22)
Use in Coatings - Consumer (PC01,PC04,PC08,PC09A,PC09B,PC09C,PC15,PC18,PC23,PC24,PC31,PC34, SU21)
Use in Cleaning Agents - Consumer (PC03,PC04,PC08,PC09A,PC09B,PC09C,PC24,PC35,PC38, SU21)
Lubricants - Consumer (Low Release) (PC01,PC24,PC31, SU21)
Lubricants - Consumer (High Release) (PC01,PC24,PC31, SU21)
Agrochemical uses - Consumer (PC12,PC27, SU21)
Use as a fuel - Consumer (PC13, SU21)
Functional Fluids - Consumer (PC16,PC17, SU21)

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

Base, U.S. NTP publications, and other sources, as appropriate.

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

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

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
Flam. Liq. 3 H226: Flammable liquid and vapor; Flammable Liquid, Cat 3
Asp. Tox. 1 H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
STOT SE 3 H336: May cause drowsiness or dizziness; Target Organ Single, Narcotic
STOT RE 1 H372: Causes damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 1
[Aquatic Acute 2 H401]: Toxic to aquatic life; Acute Env Tox, Cat 2
Aquatic Chronic 2 H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2
EUH066: Repeated exposure may cause skin dryness or cracking.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
GHS Physical Hazards information was modified.
GHS Precautionary Statements - Prevention information was modified.
GHS Precautionary Statements - Response information was modified.
Section 01: Company Mailing Address - Additional information information was modified.
Section 12: VOC - Header information was deleted.
Section 12: VOC information was deleted.

Internal Use Only
MHC: 1A, 0, 0, 0, 1, 0

DGN: ALL2480HGB (1007602)

ANNEX

Section 1 Exposure Scenario Title	
Title:	
Manufacture of substance	
Use Descriptor	
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
Processes, tasks, activities covered	
Manufacture of the substance or use as an intermediate, process chemical or extracting agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (ncluding marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard)	

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.
General measures (Flammable Liquid)
Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.
Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice.
General exposures (closed systems) PROC1
No other specific measures identified.
General exposures (closed systems) PROC2
No other specific measures identified.
General exposures (closed systems) PROC3
No other specific measures identified.
General exposures (open systems) PROC4
No other specific measures identified.
Process sampling PROC8b
No other specific measures identified.
Laboratory activities PROC15
No other specific measures identified.
Bulk transfers (open systems) PROC8b
No other specific measures identified.
Bulk transfers (closed systems) PROC8b
No other specific measures identified.
Equipment cleaning and maintenance PROC8a
No other specific measures identified.
Storage PROC1
No other specific measures identified.
Storage PROC2
No other specific measures identified.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 17000 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): 56000 kg / day
Regional use tonnage (tonnes/year): 17000 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10
Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.01 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.00003
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 10000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 3200000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
Conditions and measures related to external treatment of waste for disposal
During manufacturing no waste of the substance is generated [ETW4]
Conditions and measures related to external recovery of waste
During manufacturing no waste of the substance is generated [ERW2]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00055 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.018 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.

Section 1 Exposure Scenario Title	
Title:	
Distribution of substance	
Use Descriptor	
Sector(s) of Use	SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6A, ERC6B, ERC6C, ERC6D, ERC7
Specific Environmental Release Category	ESVOC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified.	

Process sampling PROC3
No other specific measures identified.
Laboratory activities PROC15
No other specific measures identified.
Bulk transfers (closed systems) PROC8b
No other specific measures identified.
Bulk transfers (open systems) PROC8b
No other specific measures identified.
Drum and small package filling PROC9
No other specific measures identified.
Equipment cleaning and maintenance PROC8a
No other specific measures identified.
Storage PROC1
No other specific measures identified.
Storage PROC2
No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 3.4 tons/yr Continuous release. Emission Days (days/year): 20 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.002 Maximum daily site tonnage (kg/d): 170 kg / day Regional use tonnage (tonnes/year): 1700 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.001 Release fraction to soil from process (initial release prior to RMM): 0.00001 Release fraction to wastewater from process (initial release prior to RMM): 0.000001
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day

Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 170000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000039 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00096 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.

Section 1 Exposure Scenario Title	
Title:	
Formulation and (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	SU10, SU3
Process Categories	PROC1, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC2
Specific Environmental Release Category	ESVOC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenanance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified.	

Batch processes at elevated temperatures Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC3 No other specific measures identified. **Process sampling PROC3** No other specific measures identified. **Laboratory activities PROC15** No other specific measures identified. **Bulk transfers PROC8b** No other specific measures identified. **Mixing operations (open systems) PROC5** No other specific measures identified. **Manual Transfer from/pouring from containers PROC8a** No other specific measures identified. **Drum/batch transfers PROC8b** No other specific measures identified. **Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC14** No other specific measures identified. **Drum and small package filling PROC9** No other specific measures identified. **Equipment cleaning and maintenance PROC8a** No other specific measures identified. **Storage PROC1** No other specific measures identified. **Storage PROC2** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 2400 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): 7800 kg / day Regional use tonnage (tonnes/year): 2400 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): [OOC11] 0.01 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.00002
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required.

Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 950000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00076 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0082 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.

Section 1 Exposure Scenario Title	
Title:	
Use in Coatings - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.3a.v1
Processes, tasks, activities covered	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) with sample collection Use in contained systems PROC2** No other specific measures identified. **Film formation - force drying, stoving and other technologies PROC2** No other specific measures identified. **Mixing operations (closed systems) General exposures (closed systems) PROC3**	

No other specific measures identified.
Film formation - air drying PROC4
No other specific measures identified.
Preparation of material for application Mixing operations (open systems) PROC5
No other specific measures identified.
Spraying (automatic/robotic) PROC7
provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Manual Spraying PROC7
provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Material transfers PROC8a
No other specific measures identified.
Material transfers PROC8b
No other specific measures identified.
Roller, spreader, flow application PROC10
No other specific measures identified.
Dipping, immersion and pouring PROC13
No other specific measures identified.
Laboratory activities PROC15
No other specific measures identified.
Material transfers Drum/batch transfers Transfer from/pouring from containers PROC9
No other specific measures identified.
Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC14
No other specific measures identified.
Equipment cleaning and maintenance PROC8a
No other specific measures identified.
Storage PROC1
No other specific measures identified.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 4300 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): 43000 kg / day
Regional use tonnage (tonnes/year): 4300 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10
Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM): 0.98
Release fraction to soil from process (initial release prior to RMM): 0
Release fraction to wastewater from process (initial release prior to RMM): 0.00007

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >=

0 % Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 59.8 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 270000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.014 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.16 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.

Section 1 Exposure Scenario Title	
Title:	
Use in Cleaning Agents - Industrial	
Use Descriptor	
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 4.4a.v1
Processes, tasks, activities covered	
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	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers PROC8a** No other specific measures identified. **Automated process with (semi) closed systems Use in contained systems PROC2** No other specific measures identified. **Automated process with (semi) closed systems Drum/batch transfers PROC3** No other specific measures identified. **Application of cleaning products in closed systems PROC2** No other specific measures identified.	

Filling / preparation of equipment from drums or containers PROC8b No other specific measures identified. **Use in contained batch processes PROC4** No other specific measures identified. **Degreasing small objects in cleaning station PROC13** No other specific measures identified. **Cleaning with low-pressure washers PROC10** No other specific measures identified. **Cleaning with high pressure washers PROC7** provide a good standard of controlled ventilation (10 to 15 air changes per hour). or Wear a respirator conforming to EN140 with Type A filter or better. **Manual Surfaces Cleaning PROC10** No other specific measures identified. **Storage PROC1** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
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): 1400 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
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): 0.0000003
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. 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 =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day

Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 4600000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00097 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001 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.

Section 1 Exposure Scenario Title	
Title:	
Lubricants - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC17, PROC18, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4, ERC7
Specific Environmental Release Category	ESVOC 4.6a.v1
Processes, tasks, activities covered	
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	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified. **Bulk transfers PROC8b**	

No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC8a** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC8b** No other specific measures identified. **Initial factory fill of equipment PROC9** No other specific measures identified. **Operation and lubrication of high energy open equipment PROC17** No other specific measures identified. **Operation and lubrication of high energy open equipment PROC18** No other specific measures identified. **Roller application or brushing PROC10** No other specific measures identified. **Treatment by dipping and pouring PROC13** Allow time for product to drain from workpiece **Spraying PROC7** provide a good standard of controlled ventilation (10 to 15 air changes per hour). **Maintenance (of larger plant items) and machine set up PROC8b** No other specific measures identified. **Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8b** No other specific measures identified. **Maintenance of small items PROC8a** No other specific measures identified. **Remanufacture of reject articles PROC9** No other specific measures identified. **Storage PROC1** Store substance within a closed system. **Storage PROC2** Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 10 tons/yr Continuous release. Emission Days (days/year): 20 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 1 Maximum daily site tonnage (kg/d): 500 kg / day Regional use tonnage (tonnes/year): 10 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.005 Release fraction to soil from process (initial release prior to RMM): 0.001 Release fraction to wastewater from process (initial release prior to RMM): 0.000003
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. 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 =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 460000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000044 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001 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.

Section 1 Exposure Scenario Title	
Title:	
Metal working fluids / rolling oils - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC10, PROC13, PROC17, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.7a.v1
Processes, tasks, activities covered	
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.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified.	

Bulk transfers PROC8b No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC8b** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC5** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC9** No other specific measures identified. **Process sampling PROC8b** No other specific measures identified. **Metal machining operations PROC17** No other specific measures identified. **Treatment by dipping and pouring PROC13** No other specific measures identified. **Spraying PROC7** provide a good standard of controlled ventilation (10 to 15 air changes per hour). **Roller application or brushing PROC10** No other specific measures identified. **Automated metal rolling/forming Operation is carried out at elevated temperature (> 20°C above ambient temperature). Use in contained systems PROC2** No other specific measures identified. **Semi-automated metal rolling/forming Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC17** No other specific measures identified. **Semi-automated metal rolling/forming PROC8b** No other specific measures identified. **Equipment cleaning and maintenance Dedicated facility PROC8a** No other specific measures identified. **Equipment cleaning and maintenance Non-dedicated facility PROC1** No other specific measures identified. **Storage PROC1** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
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): 100 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
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): 0.000003

Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. 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 =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 2900000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000023 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0016 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.

Section 1 Exposure Scenario Title	
Title:	
Use as a fuel - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b
Environmental Release Categories	ERC7
Specific Environmental Release Category	ESVOC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers PROC8b** Handle substance within a closed system. **Drum/batch transfers PROC8b** No other specific measures identified. **General exposures (closed systems) Use in contained batch processes PROC1** Handle substance within a closed system. **General exposures (closed systems) Use in contained batch processes PROC2** Handle substance within a closed system. **General exposures (closed systems) Use in contained batch processes PROC3** No other specific measures identified.	

General exposures (closed systems) PROC1 Handle substance within a closed system. **General exposures (closed systems) PROC2** Handle substance within a closed system. **Use as a fuel PROC16** Handle substance within a closed system. **(closed systems) General exposures (closed systems) PROC3** Handle substance within a closed system. **Equipment cleaning and maintenance PROC8a** No other specific measures identified. **Storage PROC1** Store substance within a closed system. **Storage PROC2** Store substance within a closed system. Transfer via enclosed lines
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
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): 100 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.005 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.00001
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 95 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 %

Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 1900000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
Conditions and measures related to external treatment of waste for disposal
Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1]
Conditions and measures related to external recovery of waste
This substance is consumed during use and no waste of the substance is generated [ERW3]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000047 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0026 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.

Section 1 Exposure Scenario Title	
Title:	
Functional Fluids - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC7
Specific Environmental Release Category	ESVOC 7.13a.v1
Processes, tasks, activities covered	
Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers (closed systems) PROC1** No other specific measures identified. **Bulk transfers (closed systems) PROC2** No other specific measures identified. **Drum/batch transfers PROC8b** No other specific measures identified. **Filling of articles/equipment (closed systems) PROC9** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC8a**	

No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified. **Remanufacture of reject articles PROC9** No other specific measures identified. **Equipment maintenance PROC8a** No other specific measures identified. **Storage PROC1** No other specific measures identified. **Storage PROC2** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 10 tons/yr Continuous release. Emission Days (days/year): 20 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 1 Maximum daily site tonnage (kg/d): 500 kg / day Regional use tonnage (tonnes/year): 100 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.005 Release fraction to soil from process (initial release prior to RMM): 0.001 Release fraction to wastewater from process (initial release prior to RMM): 0.000003
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 %

Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 460000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000055 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001 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.

Section 1 Exposure Scenario Title	
Title:	
Use in laboratories - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC10, PROC15
Environmental Release Categories	ERC2, ERC4
Specific Environmental Release Category	
Processes, tasks, activities covered	
Use of the substance within laboratory settings, including material transfers and equipment cleaning.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Laboratory activities PROC15** No other specific measures identified. **Cleaning PROC10** No other specific measures identified.	
Section 2.2 Control of environmental exposure	
Product characteristics	
Predominantly hydrophobic. Substance is complex UVCB.	
Duration, frequency and amount	
Annual site tonnage (tonnes/year): 0.01 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): 0.5 kg / day Regional use tonnage (tonnes/year): 0.01 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.025 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.02
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 340 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000039 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0014 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.

Section 1 Exposure Scenario Title	
Title:	
Rubber production and processing	
Use Descriptor	
Sector(s) of Use	SU10
Process Categories	PROC1, PROC13, PROC14, PROC15, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC1, ERC4, ERC6D
Specific Environmental Release Category	ESVOC 4.19.v1
Processes, tasks, activities covered	
Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Material transfers (closed systems) PROC1** No other specific measures identified. **Material transfers (closed systems) PROC2** No other specific measures identified. **Material transfers PROC8b** No other specific measures identified. **Bulk weighing PROC1** Handle substance within a closed system.	

Bulk weighing PROC2
Handle substance within a closed system.
Small scale weighing PROC9
No other specific measures identified.
Additive premixing PROC3
No other specific measures identified.
Additive premixing PROC4
No other specific measures identified.
Additive premixing PROC5
No other specific measures identified.
Material transfers PROC8b
No other specific measures identified.
Material transfers PROC9
No other specific measures identified.
Calendering (including Banburys) Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC6
No other specific measures identified.
Pressing uncured rubber blanks PROC14
No other specific measures identified.
Tyre build up PROC7
provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Vulcanisation Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC6
No other specific measures identified.
Vulcanisation Operation is carried out at elevated temperature (> 20°C above ambient temperature). Manual PROC6
No other specific measures identified.
Cooling cured articles Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC6
No other specific measures identified.
Production of articles by dipping and pouring PROC13
No other specific measures identified.
Finishing operations PROC21
No other specific measures identified.
Laboratory activities PROC15
No other specific measures identified.
Equipment maintenance PROC8a
No other specific measures identified.
Storage PROC1
Store substance within a closed system.
Storage PROC2
Store substance within a closed system.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 34 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): 1700 kg / day

Regional use tonnage (tonnes/year): 34 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.01 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.00003
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 640000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000015

Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0026
Not applicable for wide dispersive uses.
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.

Section 1 Exposure Scenario Title	
Title:	
Polymer processing - Industrial	
Use Descriptor	
Sector(s) of Use	SU10, SU3
Process Categories	PROC1, PROC13, PROC14, PROC2, PROC21, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC4
Specific Environmental Release Category	ESVOC 4.21a.v1
Processes, tasks, activities covered	
Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers (closed systems) PROC1** No other specific measures identified. **Bulk transfers (closed systems) PROC2** No other specific measures identified. **Bulk transfers PROC8b** No other specific measures identified. **Bulk weighing PROC1** No other specific measures identified. **Bulk weighing PROC2**	

No other specific measures identified.
Small scale weighing PROC9
No other specific measures identified.
Additive premixing PROC3
No other specific measures identified.
Additive premixing PROC4
No other specific measures identified.
Additive premixing Avoid carrying out activities involving exposure for more than 4 hours. PROC5
No other specific measures identified.
Bulk transfers PROC8b
No other specific measures identified.
Bulk transfers PROC9
No other specific measures identified.
Calendering (including Banburys) Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC6
No other specific measures identified.
Production of articles by dipping and pouring PROC13
No other specific measures identified.
Extrusion and masterbatching PROC14
No other specific measures identified.
Injection moulding of articles PROC14
No other specific measures identified.
Finishing operations PROC21
No other specific measures identified.
Equipment maintenance PROC8a
No other specific measures identified.
Storage PROC1
Store substance within a closed system.
Storage PROC2
Store substance within a closed system.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 300 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): 15000 kg / day
Regional use tonnage (tonnes/year): 300 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10
Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM): 0.25
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

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 80 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 15000000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00049 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095 Not applicable for wide dispersive uses. 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.

Section 1 Exposure Scenario Title	
Title:	
Water treatment chemicals - Industrial	
Use Descriptor	
Sector(s) of Use	SU3
Process Categories	PROC1, PROC13, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC3, ERC4
Specific Environmental Release Category	ESVOC 3.22a.v1
Processes, tasks, activities covered	
Covers the use of the substance for the treatment of water at industrial facilities in open and closed systems	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers Use in contained systems PROC2** Transfer via enclosed lines **Drum/batch transfers PROC8b** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified. **Pouring from small containers PROC13** No other specific measures identified.	

Equipment maintenance PROC8a No other specific measures identified. **Storage PROC1** Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 11 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): 37 kg / day Regional use tonnage (tonnes/year): 11 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.05 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.95
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 46.3 % Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 96.6 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 37 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 96.6 %
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000052 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.91 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.

Section 1 Exposure Scenario Title	
Title:	
Use in Coatings - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC15, PROC19, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.3b.v1
Processes, tasks, activities covered	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation) and equipment cleaning, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** Handle substance within a closed system. **Filling / preparation of equipment from drums or containers Use in contained systems PROC2** Handle substance within a closed system. **General exposures (closed systems) Use in contained systems PROC2** Handle substance within a closed system. **Preparation of material for application Use in contained batch processes PROC3**	

No other specific measures identified.
Film formation - air drying Outdoor. PROC4
No other specific measures identified.
Film formation - air drying Indoor PROC4
No other specific measures identified.
Preparation of material for application Indoor PROC5
No other specific measures identified.
Preparation of material for application Outdoor. PROC5
No other specific measures identified.
Material transfers Drum/batch transfers PROC8a
No other specific measures identified.
Material transfers Drum/batch transfers Dedicated facility PROC8b
No other specific measures identified.
Roller, spreader, flow application Indoor PROC10
No other specific measures identified.
Roller, spreader, flow application Outdoor. PROC10
No other specific measures identified.
Manual Spraying Indoor PROC11
provide a good standard of controlled ventilation (10 to 15 air changes per hour).
or
Wear a respirator conforming to EN140 with Type A filter or better.
Manual Spraying Outdoor. PROC11
Ensure operation is undertaken outdoors.
Avoid carrying out activities involving exposure for more than 4 hours.
OR
Wear a respirator conforming to EN140 with Type A filter or better.
Ensure operation is undertaken outdoors.
Dipping, immersion and pouring Indoor PROC13
Avoid manual contact with wet work pieces.
Dipping, immersion and pouring Outdoor. PROC13
Avoid manual contact with wet work pieces.
Laboratory activities PROC15
No other specific measures identified.
Hand application - finger paints, pastels, adhesives Indoor PROC19
No other specific measures identified.
Hand application - finger paints, pastels, adhesives Outdoor. PROC19
No other specific measures identified.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 0.84 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): 2.3 kg / day
Regional use tonnage (tonnes/year): 1700 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10
Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.98 Release fraction to soil from process (initial release prior to RMM): 0.01 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by soil. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 1900 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0012 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0012 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.

Section 1 Exposure Scenario Title	
Title:	
Use in Cleaning Agents - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC19, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.4b.v1
Processes, tasks, activities covered	
Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Filling / preparation of equipment from drums or containers PROC8b** No other specific measures identified. **Automated process with (semi) closed systems Use in contained systems PROC2** No other specific measures identified. **Automated process with (semi) closed systems Drum/batch transfers Use in contained systems PROC3** No other specific measures identified. **Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products) PROC4** No other specific measures identified.	

Filling / preparation of equipment from drums or containers PROC8a No other specific measures identified. **Manual Cleaning Dipping, immersion and pouring Surfaces PROC13** No other specific measures identified. **Cleaning with low-pressure washers Rolling, Brushing No spraying PROC10** No other specific measures identified. **Cleaning with high pressure washers Spraying Indoor PROC11** provide a good standard of controlled ventilation (10 to 15 air changes per hour). or Wear a respirator conforming to EN140 with Type A filter or better. **Cleaning with high pressure washers Spraying Outdoor. PROC11** Ensure operation is undertaken outdoors. Limit the substance content in the mixture to 25 %. or Wear a respirator conforming to EN140 with Type A filter or better. **Manual Cleaning Surfaces Spraying PROC10** No other specific measures identified. **Ad hoc manual application via trigger sprays, dipping, etc. Rolling, Brushing PROC10** No other specific measures identified. **Application of cleaning products in closed systems Outdoor. PROC4** No other specific measures identified. **Cleaning of medical devices PROC4** No other specific measures identified. **Storage PROC1** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.17 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): 0.47 kg / day Regional use tonnage (tonnes/year): 340 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
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
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater.

Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 470 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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
This substance is consumed during use and no waste of the substance is generated [ERW3]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000039 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095 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.

Section 1 Exposure Scenario Title	
Title:	
Use in oil field drilling and production operations - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC8D
Specific Environmental Release Category	ESVOC 8.5b.v1
Processes, tasks, activities covered	
Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers PROC8b** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC8b** No other specific measures identified. **Drilling mud (re-)formulation PROC3** No other specific measures identified. **Drill floor operations PROC4** No other specific measures identified. **Operation of solids filtering equipment - vapour exposures PROC4** No other specific measures identified.	

Cleaning of solids filtering equipment PROC8a No other specific measures identified. **Treatment and disposal of filtered solids PROC3** No other specific measures identified. **Process sampling PROC3** No other specific measures identified. **General exposures (closed systems) PROC1** No other specific measures identified. **Pouring from small containers PROC8a** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified. **Equipment cleaning and maintenance PROC8a** No other specific measures identified. **Batch process PROC2** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): Not Applicable Emission Days (days/year): Not Applicable Fraction of EU tonnage used in region: 1 Fraction of Regional tonnage used Locally: Not Applicable Maximum daily site tonnage (kg/d): Not Applicable Regional use tonnage (tonnes/year): 168 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] Not Applicable Local marine water dilution factor: [EF2] Not Applicable
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): Not Applicable Release fraction to wastewater from process (initial release prior to RMM): Not Applicable
Technical conditions and measures at process level (source) to prevent release
Discharge to aquatic environment is restricted (see Section 4.2) [TCS2]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: Not Applicable Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: Not Applicable
Organisation measures to prevent/limit release from site
Not applicable
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] Not Applicable The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: Not Applicable Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: Not Applicable
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste

External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]
3.2. Environment
Qualitative approach used to conclude safe use [EE8] Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment [EE7]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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
Discharge to aquatic environment is restricted by law and industry prohibits release [DSU9]

Section 1 Exposure Scenario Title	
Title:	
Lubricants - Professional (Low Release)	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.6b.v1
Processes, tasks, activities covered	
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	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **Operation of equipment containing engine oils and similar PROC20** No other specific measures identified.	

General exposures (open systems) PROC4 No other specific measures identified. **Bulk transfers PROC8b** No other specific measures identified. **Filling / preparation of equipment from drums or containers Dedicated facility PROC8b** No other specific measures identified. **Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a** No other specific measures identified. **Operation and lubrication of high energy open equipment Indoor PROC17** No other specific measures identified. **Operation and lubrication of high energy open equipment PROC18** No other specific measures identified. **Operation and lubrication of high energy open equipment Outdoor. PROC17** No other specific measures identified. **Maintenance (of larger plant items) and machine set up PROC8b** No other specific measures identified. **Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8b** No other specific measures identified. **Maintenance of small items Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8a** Drain or remove substance from equipment prior to break-in or maintenance. **Engine lubricant service PROC9** No other specific measures identified. **Roller application or brushing PROC10** No other specific measures identified. **Spraying PROC11** provide a good standard of controlled ventilation (10 to 15 air changes per hour). **Treatment by dipping and pouring PROC13** No other specific measures identified. **Storage PROC1** No other specific measures identified. **Storage PROC2** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.018 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): 35 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.01 Release fraction to soil from process (initial release prior to RMM): 0.01

Release fraction to wastewater from process (initial release prior to RMM): 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 46 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000026 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00097 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.

Section 1 Exposure Scenario Title	
Title:	
Lubricants - Professional (High Release)	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC17, PROC18, PROC2, PROC20, PROC3, PROC4, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.6c.v1
Processes, tasks, activities covered	
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	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **Operation of equipment containing engine oils and similar PROC20** No other specific measures identified.	

General exposures (open systems) PROC4
No other specific measures identified.
Bulk transfers PROC8b
No other specific measures identified.
Filling / preparation of equipment from drums or containers Dedicated facility PROC8b
No other specific measures identified.
Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a
No other specific measures identified.
Operation and lubrication of high energy open equipment Indoor PROC17
No other specific measures identified.
Operation and lubrication of high energy open equipment PROC18
No other specific measures identified.
Operation and lubrication of high energy open equipment Outdoor. PROC17
No other specific measures identified.
Maintenance (of larger plant items) and machine set up PROC8b
No other specific measures identified.
Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8b
No other specific measures identified.
Maintenance of small items Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8a
Drain or remove substance from equipment prior to break-in or maintenance.
Engine lubricant service PROC9
No other specific measures identified.
Roller application or brushing PROC10
No other specific measures identified.
Spraying PROC11
provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Treatment by dipping and pouring PROC13
No other specific measures identified.
Storage PROC1
No other specific measures identified.
Storage PROC2
No other specific measures identified.

Section 2.2 Control of environmental exposure

Product characteristics

Predominantly hydrophobic.
Substance is complex UVCB.

Duration, frequency and amount

Annual site tonnage (tonnes/year): 0.018 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): 0.048 kg / day
Regional use tonnage (tonnes/year): 35 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10
Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM): 0.15
Release fraction to soil from process (initial release prior to RMM): 0.05

Release fraction to wastewater from process (initial release prior to RMM): 0.05
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 43 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00013 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0011 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.

Section 1 Exposure Scenario Title	
Title:	
Metal working fluids / rolling oils - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC17, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.7c.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs (MWFs) including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **General exposures (closed systems) PROC1** Handle substance within a closed system. **General exposures (closed systems) PROC2** Handle substance within a closed system. **General exposures (closed systems) PROC3** Handle substance within a closed system. **Bulk transfers PROC8b** No other specific measures identified.	

Filling / preparation of equipment from drums or containers Dedicated facility PROC8b No other specific measures identified. **Filling / preparation of equipment from drums or containers Dedicated facility PROC9** No other specific measures identified. **Filling / preparation of equipment from drums or containers Non-dedicated facility PROC8a** No other specific measures identified. **Process sampling PROC8b** Use dedicated equipment. **Metal machining operations PROC17** No other specific measures identified. **Roller application or brushing PROC10** No other specific measures identified. **Spraying PROC11** provide a good standard of controlled ventilation (10 to 15 air changes per hour). or Wear a respirator conforming to EN140 with Type A/P2 filter or better. **Treatment by dipping and pouring PROC13** Allow time for product to drain from workpiece **Equipment cleaning and maintenance Non-dedicated facility PROC8a** No other specific measures identified. **Equipment cleaning and maintenance Dedicated facility PROC8b** No other specific measures identified. **Storage PROC1** Store substance within a closed system. **Storage PROC2** Store substance within a closed system. **Filling / preparation of equipment from drums or containers PROC5** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.0093 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): 0.025 kg / day Regional use tonnage (tonnes/year): 19 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.15 Release fraction to soil from process (initial release prior to RMM): 0.05 Release fraction to wastewater from process (initial release prior to RMM): 0.05
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >=

0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 24 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000068 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001 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.

Section 1 Exposure Scenario Title	
Title:	
Agrochemical uses - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC11, PROC13, PROC2, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.11a.v1
Processes, tasks, activities covered	
Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Transfer from/pouring from containers PROC8b** No other specific measures identified. **Mixing operations (open systems) PROC4** No other specific measures identified. **Spraying/fogging by manual application PROC11** Ensure operation is undertaken outdoors. Avoid carrying out activities involving exposure for more than 4 hours. **Spraying/fogging by machine application PROC11** Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.	

Ad hoc manual application via trigger sprays, dipping, etc. PROC13
No other specific measures identified.
Equipment cleaning and maintenance PROC8a
No other specific measures identified.
Disposal of wastes PROC8a
No other specific measures identified.
Storage PROC1
Store substance within a closed system.
Storage PROC2
Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.019 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): 0.053 kg / day Regional use tonnage (tonnes/year): 9.6 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.9 Release fraction to soil from process (initial release prior to RMM): 0.09 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 51 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000028 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00097 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.

Section 1 Exposure Scenario Title	
Title:	
Use as a fuel - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers PROC8b** Handle substance within a closed system. Clear transfer lines prior to de-coupling. **Drum/batch transfers PROC8b** No other specific measures identified. **refuelling PROC8b** No other specific measures identified. **General exposures (closed systems) PROC1** Handle substance within a closed system. **General exposures (closed systems) PROC2**	

Handle substance within a closed system. **General exposures (closed systems) (closed systems) PROC3** No other specific measures identified. **Use as a fuel PROC16** No other specific measures identified. **Equipment cleaning and maintenance PROC8a** No other specific measures identified. **Storage PROC1** Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.05 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): 0.14 kg / day Regional use tonnage (tonnes/year): 100 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
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): 0.00001
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 140 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
Conditions and measures related to external treatment of waste for disposal
Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1]

Conditions and measures related to external recovery of waste
This substance is consumed during use and no waste of the substance is generated [ERW3]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000004 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095 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.

Section 1 Exposure Scenario Title	
Title:	
Functional Fluids - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC2, PROC20, PROC3, PROC8a, PROC9
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.13b.v1
Processes, tasks, activities covered	
Use as functional fluids e.g. cable oils, transfer oils, insulators, refrigerants, hydraulic fluids in closed professional equipment including incidental exposures during maintenance and related material transfers.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Drum/batch transfers PROC8a** No other specific measures identified. **Transfer from/pouring from containers PROC9** No other specific measures identified. **Filling / preparation of equipment from drums or containers PROC9** No other specific measures identified. **General exposures (closed systems) PROC1** No other specific measures identified. **General exposures (closed systems) PROC2** No other specific measures identified.	

General exposures (closed systems) PROC3 No other specific measures identified. **Operation of equipment containing engine oils and similar PROC20** No other specific measures identified. **Operation is carried out at elevated temperature (> 20°C above ambient temperature). Operation of equipment containing engine oils and similar PROC20** No other specific measures identified. **Remanufacture of reject articles PROC9** No other specific measures identified. **Equipment maintenance PROC8a** No other specific measures identified. **Storage PROC1** No other specific measures identified. **Storage PROC2** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.05 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): 0.14 kg / day Regional use tonnage (tonnes/year): 100 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.05 Release fraction to soil from process (initial release prior to RMM): 0.025 Release fraction to wastewater from process (initial release prior to RMM): 0.025
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 %

Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 120 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00018 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0011 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.

Section 1 Exposure Scenario Title	
Title:	
Road and construction applications	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC10, PROC11, PROC13, PROC2, PROC8a, PROC8b, PROC9
Environmental Release Categories	ERC8D, ERC8F
Specific Environmental Release Category	ESVOC 8.15.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading)	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Drum/batch transfers Non-dedicated facility PROC8a** No other specific measures identified. **Drum/batch transfers Dedicated facility PROC8b** Clear transfer lines prior to de-coupling. Use dedicated equipment. **Drum/batch transfers Dedicated facility Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8b** Clear transfer lines prior to de-coupling. Use dedicated equipment. **Roller application or brushing PROC10**	

No other specific measures identified. **Spraying/fogging by machine application Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC11** Wear a respirator conforming to EN140 with Type A filter or better. Ensure operation is undertaken outdoors. **Spraying/fogging by machine application PROC11** provide a good standard of controlled ventilation (10 to 15 air changes per hour). **Dipping, immersion and pouring PROC13** No other specific measures identified. **Equipment cleaning and maintenance PROC8a** Retain drain downs in sealed storage pending disposal or for subsequent recycle. **Drum and small package filling PROC9** No other specific measures identified.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.093 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): 0.25 kg / day Regional use tonnage (tonnes/year): 190 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.95 Release fraction to soil from process (initial release prior to RMM): 0.04 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 230 kg / day

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.00014 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0011 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.

Section 1 Exposure Scenario Title	
Title:	
Use in laboratories - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC10, PROC15
Environmental Release Categories	ERC8A
Specific Environmental Release Category	ESVOC 8.17.v1
Processes, tasks, activities covered	
Use of small quantities within laboratory settings, including material transfers and equipment cleaning.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Laboratory activities PROC15** No other specific measures identified. **Cleaning PROC10** No other specific measures identified.	
Section 2.2 Control of environmental exposure	
Product characteristics	
Predominantly hydrophobic. Substance is complex UVCB.	
Duration, frequency and amount	
Annual site tonnage (tonnes/year): 0.000005 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): 0.000014 kg / day Regional use tonnage (tonnes/year): 0.01 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.5 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.5
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 0.014 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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.
Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000043
Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095
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.

Section 1 Exposure Scenario Title	
Title:	
Polymer processing - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC14, PROC2, PROC21, PROC6, PROC8a, PROC8b
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.21b.v1
Processes, tasks, activities covered	
Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Bulk transfers (closed systems) PROC1** Handle substance within a closed system. **Bulk transfers (closed systems) PROC2** Handle substance within a closed system. **Material transfers PROC8b** Transfer via enclosed lines **Injection moulding of articles PROC6** No other specific measures identified. **Injection moulding of articles PROC14**	

No other specific measures identified. **Rework of articles PROC21** No other specific measures identified. **Equipment maintenance PROC8a** Drain or remove substance from equipment prior to break-in or maintenance. **Storage PROC1** Store substance within a closed system. **Storage PROC2** Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.14 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): 0.38 kg / day Regional use tonnage (tonnes/year): 280 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.98 Release fraction to soil from process (initial release prior to RMM): 0.01 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 0 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 320 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0002 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0011 Not applicable for wide dispersive uses. 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.

Section 1 Exposure Scenario Title	
Title:	
Water treatment chemicals - Professional	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC1, PROC13, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC8F
Specific Environmental Release Category	ESVOC 8.22b.v1
Processes, tasks, activities covered	
Covers the use of the substance for the treatment of water in open and closed systems.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2] Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1] Assumes use at not more than 20°C above ambient temperature[G15]	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) 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. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the recast ATEX Directive 2014/34/EU. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level. Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice. **Drum/batch transfers PROC8b** No other specific measures identified. **General exposures (closed systems) PROC3** No other specific measures identified. **General exposures (open systems) PROC4** No other specific measures identified. **Pouring from small containers PROC13** No other specific measures identified. **Equipment maintenance PROC8a** No other specific measures identified.	

Storage PROC1
Store substance within a closed system.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 1.5 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 1 Maximum daily site tonnage (kg/d): 4 kg / day Regional use tonnage (tonnes/year): 4.5 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.01 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.99
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
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 soil. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 69.8 %
Organisation measures to prevent/limit release from site
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.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 19 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 93.7 %
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 an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
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 exposrue with the Petrorisk model.[EE2]

Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.21 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.21 Not applicable for wide dispersive uses. 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.

Section 1 Exposure Scenario Title	
Title:	
Use in Coatings - Consumer	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC01, PC04, PC08, PC09A, PC09B, PC09C, PC15, PC18, PC23, PC24, PC31, PC34
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.3c.v1
Processes, tasks, activities covered	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Adhesives, sealants Glues, hobby use PC01** Covers concentrations up to 30 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 35.73 cm2 For each use event, covers use amounts up to 9 grams Covers use under typical household ventilation. Covers use in room size of 20 m^3 Covers exposure up to 4 hour(s) Liquid, vapour pressure < 0,5 kPa at STP.	

Covers use at ambient temperatures.
Adhesives, sealants Glues, DIY-use (carpet glue, tile glue, wood parquet glue) PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 1 days/yr
Covers skin contact area up to 110 cm2
For each use event, covers use amounts up to 6390 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 6 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Adhesives, sealants Glue from spray PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 85.05 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Adhesives, sealants Sealants PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 75 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Anti-freeze and de-icing products Washing car window PC04
Covers concentrations up to 1 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
For each use event, covers use amounts up to 0.5 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.02 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Covers skin contact area up to 857.5 cm2
Anti-freeze and de-icing products Pouring into radiator PC04
Covers concentrations up to 10 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 428 cm2
For each use event, covers use amounts up to 2000 grams
Covers use in a one car garage (34 m3) under typical ventilation.

Covers use in room size of 34 m³
Covers exposure up to 0.17 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Anti-freeze and de-icing products Lock de-icer PC04
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 214.4 cm2
For each use event, covers use amounts up to 4 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.25 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Biocidal products (e.g. disinfectants, pest control) Laundry and dish washing products PC08
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 15 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.5 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Biocidal products (e.g. disinfectants, pest control) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) PC08
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 27 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Biocidal products (e.g. disinfectants, pest control) Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) PC08
Covers concentrations up to 15 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 428 cm2
For each use event, covers use amounts up to 35 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.17 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Coatings and paints, thinners, paint removers Waterborne latex wall paint PC09A
Covers concentrations up to 1.5 %

Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 2760 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Coatings and paints, thinners, paint removers Solvent rich, high solid, water borne paint PC09A
Covers concentrations up to 27.5 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 744 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Coatings and paints, thinners, paint removers Aerosol spray can PC09A
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 2 days/yr
For each use event, covers use amounts up to 215 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.33 hour(s)
Covers skin contact area up to 857.5 cm2
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Coatings and paints, thinners, paint removers Removers (paint-, glue-, wall paper-, sealant-remover) PC09A
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 3 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 491 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Fillers, putties, plasters, modelling clay fillers and Putty PC09B
Covers concentrations up to 2 %
Covers use up to 1 times per day
Covers use up to 12 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 85 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.

Liquid, vapour pressure < 0,5 kPa at STP.
Fillers, putties, plasters, modelling clay Plasters and floor equalizers PC09B
Covers concentrations up to 2 %
Covers use up to 1 times per day
Covers use up to 12 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 13800 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Fillers, putties, plasters, modelling clay Modelling clay PC09B
Covers concentrations up to 1 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 254.4 cm2
For each use event, assumes swallowed amount of 1 grams
Liquid, vapour pressure < 0,5 kPa at STP.
For each use event, covers use amounts up to 13800 grams
Covers exposure up to 6 hour(s)
Covers use in room size of 20 m³
Covers use under typical household ventilation.
Covers use at ambient temperatures.
Finger paints PC09C
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 254.4 cm2
For each use event, assumes swallowed amount of 1.35 grams
Covers exposure up to 6 hour(s)
Covers use in room size of 20 m³
Covers use under typical household ventilation.
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
For each use event, covers use amounts up to 13800 grams
Non-metal-surface treatment products Waterborne latex wall paint PC15
Covers concentrations up to 1.5 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 2760 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Non-metal-surface treatment products Solvent rich, high solid, water borne paint PC15
Covers concentrations up to 27.5 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 428.75 cm2

For each use event, covers use amounts up to 744 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Non-metal-surface treatment products Aerosol spray can PC15
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 2 days/yr
For each use event, covers use amounts up to 215 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers skin contact area up to 857.5 cm2
Covers use at ambient temperatures.
Non-metal-surface treatment products Removers (paint-, glue-, wall paper-, sealant-remover) PC15
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 3 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 491 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Ink and toners PC18
Covers concentrations up to 10 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 71.4 cm2
For each use event, covers use amounts up to 40 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Leather tanning, dye, finishing, impregnation and care products Polishes, wax / cream (floor, furniture, shoes) PC23
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 29 days/yr
Covers skin contact area up to 430 cm2
For each use event, covers use amounts up to 56 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1.23 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Leather tanning, dye, finishing, impregnation and care products Polishes, spray (furniture, shoes) PC23

Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 8 days/yr
Covers skin contact area up to 430 cm2
For each use event, covers use amounts up to 56 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Lubricants, Greases and Release products Liquids PC24
Covers concentrations up to 100 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 2200 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.17 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Lubricants, Greases and Release products Pastes PC24
Covers concentrations up to 20 %
Covers use up to 1 times per day
Covers use up to 10 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 34 grams
Covers exposure up to 4 hour(s)
Covers use in room size of 20 m³
Covers use at ambient temperatures.
Covers use under typical household ventilation.
Liquid, vapour pressure < 0,5 kPa at STP.
Lubricants, Greases and Release products Sprays PC24
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 73 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.17 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Polishes and wax blends Polishes, wax / cream (floor, furniture, shoes) PC31
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 29 days/yr
Covers skin contact area up to 430 cm2
For each use event, covers use amounts up to 142 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1.23 hour(s)

Liquid, vapour pressure < 0,5 kPa at STP. Covers use at ambient temperatures. **Polishes and wax blends Polishes, spray (furniture, shoes) PC31** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 8 days/yr Covers skin contact area up to 430 cm2 For each use event, covers use amounts up to 35 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 0.33 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC34** Covers concentrations up to 10 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 857.5 cm2 For each use event, covers use amounts up to 115 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 1 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 2.2 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 6 kg / day Regional use tonnage (tonnes/year): 4400 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.985 Release fraction to air from wide dispersive use (regional only): 0.985 Release fraction to soil from process (initial release prior to RMM): 0.005 Release fraction to soil from wide dispersive use (regional only): 0.005 Release fraction to wastewater from process (initial release prior to RMM): 0.01 Release fraction to wastewater from wide dispersive use: 0.01
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 1900 kg / day

Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0032 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.0031

Section 1 Exposure Scenario Title	
Title:	
Use in Cleaning Agents - Consumer	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC03, PC04, PC08, PC09A, PC09B, PC09C, PC24, PC35, PC38
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.4c.v1
Processes, tasks, activities covered	
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Air care products Air care, instant action (aerosol sprays) PC03** Covers concentrations up to 50 % Covers use up to 4 times per day Covers use up to 365 days/yr For each use event, covers use amounts up to 0.1 grams Covers use under typical household ventilation. Covers use in room size of 20 m^3 Covers exposure up to 0.25 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers skin contact area up to 857.5 cm2 Covers use at ambient temperatures.	

Air care products Air care, continuous action (solid and liquid) PC03
Covers concentrations up to 10 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 35.7 cubic cm
For each use event, covers use amounts up to 0.48 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 8 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Anti-freeze and de-icing products Washing car window PC04
Covers concentrations up to 1 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
For each use event, covers use amounts up to 0.5 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.02 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Covers skin contact area up to 857.5 cm2
Anti-freeze and de-icing products Pouring into radiator PC04
Covers concentrations up to 10 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 428 cm2
For each use event, covers use amounts up to 2000 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Anti-freeze and de-icing products Lock de-icer PC04
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 214.4 cm2
For each use event, covers use amounts up to 4 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.25 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Biocidal products (e.g. disinfectants, pest control) Laundry and dish washing products PC08
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 15 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³

Covers exposure up to 0.5 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Biocidal products (e.g. disinfectants, pest control) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) PC08
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 27 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Biocidal products (e.g. disinfectants, pest control) Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) PC08
Covers concentrations up to 15 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 428 cm2
For each use event, covers use amounts up to 35 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Coatings and paints, thinners, paint removers Waterborne latex wall paint PC09A
Covers concentrations up to 1.5 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 2760 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Coatings and paints, thinners, paint removers Solvent rich, high solid, water borne paint PC09A
Covers concentrations up to 27.5 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 744 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2.2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Coatings and paints, thinners, paint removers Aerosol spray can PC09A
Covers concentrations up to 50 %
Covers use up to 1 times per day

Covers use up to 2 days/yr
For each use event, covers use amounts up to 215 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Covers skin contact area up to 857.5 cm2
Coatings and paints, thinners, paint removers Removers (paint-, glue-, wall paper-, sealant-remover) PC09A
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 3 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 491 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Fillers, putties, plasters, modelling clay fillers and Putty PC09B
Covers concentrations up to 2 %
Covers use up to 1 times per day
Covers use up to 12 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 85 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 4 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Fillers, putties, plasters, modelling clay Plasters and floor equalizers PC09B
Covers concentrations up to 2 %
Covers use up to 1 times per day
Covers use up to 12 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 13800 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 2 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Fillers, putties, plasters, modelling clay Modelling clay PC09B
Covers concentrations up to 1 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 254.4 cm2
For each use event, assumes swallowed amount of 1 grams
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
For each use event, covers use amounts up to 13800 grams
Covers use in room size of 20 m³
Covers exposure up to 8 hour(s)

Covers use under typical household ventilation.
Finger paints PC09C
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 254.4 cm2
For each use event, assumes swallowed amount of 1.35 grams
Covers exposure up to 8 hour(s)
For each use event, covers use amounts up to 13800 grams
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use in room size of 20 m^3
Covers use under typical household ventilation.
Lubricants, Greases and Release products Liquids PC24
Covers concentrations up to 100 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 2200 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m^3
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Lubricants, Greases and Release products Pastes PC24
Covers concentrations up to 20 %
Covers use up to 1 times per day
Covers use up to 10 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 34 grams
Covers use in room size of 20 m^3
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Covers use under typical household ventilation.
Covers exposure up to 4 hour(s)
Lubricants, Greases and Release products Sprays PC24
Covers concentrations up to 50 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 428.75 cm2
For each use event, covers use amounts up to 73 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m^3
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Washing and cleaning products (including solvent based products) Laundry and dish washing products PC35
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 15 grams

Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.5 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Washing and cleaning products (including solvent based products) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) PC35
Covers concentrations up to 5 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 857.5 cm2
For each use event, covers use amounts up to 27 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.33 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Washing and cleaning products (including solvent based products) Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) PC35
Covers concentrations up to 15 %
Covers use up to 1 times per day
Covers use up to 128 days/yr
Covers skin contact area up to 428 cm2
For each use event, covers use amounts up to 35 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Welding and soldering products (with flux coatings or flux cores), flux products PC38
Covers concentrations up to 20 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
For each use event, covers use amounts up to 12 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Covers skin contact area up to 857.5 cm2
Air care products Air care, instant action (aerosol sprays) PC03
Covers concentrations up to 50 %
Covers use up to 4 times per day
Covers use up to 365 days/yr
For each use event, covers use amounts up to 0.5 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 0.25 hour(s)
Covers skin contact area up to 857.5 cm2
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Air care products Air care, continuous action (solid and liquid) PC03

Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 35.7 cm2 For each use event, covers use amounts up to 0.48 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 8 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers use at ambient temperatures.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.025 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 0.068 kg / day Regional use tonnage (tonnes/year): 50 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.95 Release fraction to soil from process (initial release prior to RMM): 0.025 Release fraction to wastewater from process (initial release prior to RMM): 0.025
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 63 kg / day
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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.
Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000091
Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001

Section 1 Exposure Scenario Title	
Title:	
Lubricants - Consumer (Low Release)	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC01, PC24, PC31
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.6d.v1
Processes, tasks, activities covered	
Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Adhesives, sealants Glues, hobby use PC01** Covers concentrations up to 30 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 35.73 cm2 For each use event, covers use amounts up to 9 grams Covers use under typical household ventilation. Covers use in room size of 20 m^3 Covers exposure up to 4 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Adhesives, sealants Glues, DIY-use (carpet glue, tile glue, wood parquet glue) PC01**	

Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 1 days/yr
Covers skin contact area up to 110 cm2
For each use event, covers use amounts up to 6390 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 6 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Adhesives, sealants Glue from spray PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 85.05 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Adhesives, sealants Sealants PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 75 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Lubricants, Greases and Release products Liquids PC24
Covers concentrations up to 100 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 2200 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.17 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Lubricants, Greases and Release products Pastes PC24
Covers concentrations up to 20 %
Covers use up to 1 times per day
Covers use up to 10 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 34 grams
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.
Covers use under typical household ventilation.

Covers use in room size of 20 m³ Liquid, vapour pressure < 0,5 kPa at STP. **Lubricants, Greases and Release products Sprays PC24** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 6 days/yr Covers skin contact area up to 428.75 cm2 For each use event, covers use amounts up to 73 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 0.17 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Polishes and wax blends Polishes, wax / cream (floor, furniture, shoes) PC31** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 29 days/yr Covers skin contact area up to 430 cm2 For each use event, covers use amounts up to 142 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 1.23 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Polishes and wax blends Polishes, spray (furniture, shoes) PC31** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 8 days/yr Covers skin contact area up to 430 cm2 For each use event, covers use amounts up to 35 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 0.33 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.013 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 0.034 kg / day Regional use tonnage (tonnes/year): 25 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.01

Release fraction to soil from process (initial release prior to RMM): 0.01 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 33 kg / day
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000022 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00097

Section 1 Exposure Scenario Title	
Title:	
Lubricants - Consumer (High Release)	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC01, PC24, PC31
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.6e.v1
Processes, tasks, activities covered	
Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Adhesives, sealants Glues, hobby use PC01** Covers concentrations up to 30 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 35.73 cm2 For each use event, covers use amounts up to 9 grams Covers use under typical household ventilation. Covers use in room size of 20 m^3 Covers exposure up to 4 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers use at ambient temperatures. **Adhesives, sealants Glues, DIY-use (carpet glue, tile glue, wood parquet glue) PC01**	

Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 1 days/yr
Covers skin contact area up to 110 cm2
For each use event, covers use amounts up to 6390 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 6 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Adhesives, sealants Glue from spray PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 6 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 85.05 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Adhesives, sealants Sealants PC01
Covers concentrations up to 30 %
Covers use up to 1 times per day
Covers use up to 365 days/yr
Covers skin contact area up to 35.73 cm2
For each use event, covers use amounts up to 75 grams
Covers use under typical household ventilation.
Covers use in room size of 20 m³
Covers exposure up to 1 hour(s)
Covers use at ambient temperatures.
Liquid, vapour pressure < 0,5 kPa at STP.
Lubricants, Greases and Release products Liquids PC24
Covers concentrations up to 100 %
Covers use up to 1 times per day
Covers use up to 4 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 2200 grams
Covers use in a one car garage (34 m3) under typical ventilation.
Covers use in room size of 34 m³
Covers exposure up to 0.17 hour(s)
Liquid, vapour pressure < 0,5 kPa at STP.
Covers use at ambient temperatures.
Lubricants, Greases and Release products Pastes PC24
Covers concentrations up to 20 %
Covers use up to 1 times per day
Covers use up to 10 days/yr
Covers skin contact area up to 468 cm2
For each use event, covers use amounts up to 34 grams
Covers exposure up to 4 hour(s)
Covers use at ambient temperatures.
Covers use in room size of 20 m³

Covers use under typical household ventilation. Liquid, vapour pressure < 0,5 kPa at STP. **Lubricants, Greases and Release products Sprays PC24** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 6 days/yr Covers skin contact area up to 428.75 cm2 For each use event, covers use amounts up to 73 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 0.17 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Polishes and wax blends Polishes, wax / cream (floor, furniture, shoes) PC31** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 29 days/yr Covers skin contact area up to 430 cm2 For each use event, covers use amounts up to 142 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 1.23 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Polishes and wax blends Polishes, spray (furniture, shoes) PC31** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 8 days/yr Covers skin contact area up to 430 cm2 For each use event, covers use amounts up to 35 grams Covers use under typical household ventilation. Covers use in room size of 20 m³ Covers exposure up to 0.33 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers use at ambient temperatures.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.013 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 0.034 kg / day Regional use tonnage (tonnes/year): 25 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.15

Release fraction to soil from process (initial release prior to RMM): 0.05 Release fraction to wastewater from process (initial release prior to RMM): 0.05
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 31 kg / day
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000091 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.001

Section 1 Exposure Scenario Title	
Title:	
Agrochemical uses - Consumer	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC12, PC27
Environmental Release Categories	ERC8A, ERC8D
Specific Environmental Release Category	ESVOC 8.11b.v1
Processes, tasks, activities covered	
Covers the consumer use of agrochemicals in liquid and solid forms.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Fertilizers Lawn and garden preparations PC12** Covers concentrations up to 50 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 857.5 cm2 For each use event, assumes swallowed amount of 0.3 grams Covers use at ambient temperatures. Covers use in room size of 20 m^3 Covers use under typical household ventilation. Liquid, vapour pressure < 0,5 kPa at STP. Covers exposure up to 4 hour(s) **Plant protection products PC27** Covers concentrations up to 50 %	

Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 857.5 cm2 For each use event, assumes swallowed amount of 0.3 grams Liquid, vapour pressure < 0,5 kPa at STP. Covers use in room size of 20 m³ Covers use under typical household ventilation. Covers use at ambient temperatures. Covers exposure up to 4 hour(s)
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.0036 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 0.0099 kg / day Regional use tonnage (tonnes/year): 1.8 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.9 Release fraction to soil from process (initial release prior to RMM): 0.09 Release fraction to wastewater from process (initial release prior to RMM): 0.01
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 9.7 kg / day
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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.
Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000092
Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095

Section 1 Exposure Scenario Title	
Title:	
Use as a fuel - Consumer	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC13
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Liquid: Automotive Refuelling PC13** Covers concentrations up to 100 % Covers use up to 1 times per day Covers use up to 52 days/yr Covers skin contact area up to 210 cm2 For each use event, covers use amounts up to 37500 grams Covers outdoor use. Covers use in room size of 100 m^3 Covers exposure up to 0.05 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Liquid Scooter Refuelling PC13** Covers concentrations up to 100 %	

Covers use up to 1 times per day Covers use up to 52 days/yr Covers skin contact area up to 210 cm2 For each use event, covers use amounts up to 3750 grams Covers outdoor use. Covers use in room size of 100 m³ Covers exposure up to 0.03 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers use at ambient temperatures. **Liquid, Garden Equipment - Use PC13** Covers concentrations up to 100 % Covers use up to 1 times per day Covers use up to 26 days/yr For each use event, covers use amounts up to 750 grams Covers outdoor use. Covers use in room size of 100 m³ Covers exposure up to 2 hour(s) Covers skin contact area up to 420 cm2 Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Liquid: Garden Equipment - Refueling PC13** Covers concentrations up to 100 % Covers use up to 1 times per day Covers use up to 26 days/yr Covers skin contact area up to 420 cm2 For each use event, covers use amounts up to 750 grams Covers use in a one car garage (34 m3) under typical ventilation. Covers use in room size of 34 m³ Covers exposure up to 0.03 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Liquid: Home space heater fuel PC13** Covers concentrations up to 100 % Covers use up to 1 times per day Covers use up to 365 days/yr Covers skin contact area up to 210 cm2 For each use event, covers use amounts up to 3000 grams Covers use in room size of 20 m³ Covers exposure up to 0.03 hour(s) Covers use under typical household ventilation. Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.015 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005

Maximum daily site tonnage (kg/d): 0.04 kg / day Regional use tonnage (tonnes/year): 29 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
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): 0.00001
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 39 kg / day
Conditions and measures related to external treatment of waste for disposal
Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1]
Conditions and measures related to external recovery of waste
This substance is consumed during use and no waste of the substance is generated [ERW3]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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. Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.0000039 Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00095

Section 1 Exposure Scenario Title	
Title:	
Functional Fluids - Consumer	
Use Descriptor	
Sector(s) of Use	SU21
Product Categories	PC16, PC17
Environmental Release Categories	ERC9A, ERC9B
Specific Environmental Release Category	ESVOC 9.13c.v1
Processes, tasks, activities covered	
Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of consumer exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Not applicable	
Other given operational conditions affecting consumer exposure	
Not applicable	
Contributing Scenarios/ **Specific Risk Management Measures and Operating Conditions** (only required controls to demonstrate safe use listed)	
General measures (Aspiration Hazard) The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard. Do not ingest. If swallowed then seek immediate medical attention. Do NOT induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps may lead to life threatening lung damage. Keep lamps filled with this liquid out of the reach of children. **General measures (Flammable Liquid)** Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid ignition sources – No Smoking. Review SDS for additional advice. **Heat transfer fluids Liquids PC16** Covers concentrations up to 100 % Covers use up to 1 times per day Covers use up to 4 days/yr Covers skin contact area up to 468 cm2 For each use event, covers use amounts up to 2200 grams Covers use in a one car garage (34 m3) under typical ventilation. Covers use in room size of 34 m^3 Covers exposure up to 0.17 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP. **Hydraulic fluids Liquids PC17** Covers concentrations up to 100 %	

Covers use up to 1 times per day Covers use up to 4 days/yr Covers skin contact area up to 468 cm2 For each use event, covers use amounts up to 2200 grams Covers use in a one car garage (34 m3) under typical ventilation. Covers use in room size of 34 m^3 Covers exposure up to 0.17 hour(s) Covers use at ambient temperatures. Liquid, vapour pressure < 0,5 kPa at STP.
Section 2.2 Control of environmental exposure
Product characteristics
Predominantly hydrophobic. Substance is complex UVCB.
Duration, frequency and amount
Annual site tonnage (tonnes/year): 0.01 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 0.027 kg / day Regional use tonnage (tonnes/year): 20 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.05 Release fraction to soil from process (initial release prior to RMM): 0.025 Release fraction to wastewater from process (initial release prior to RMM): 0.025
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 93.7 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 26 kg / day
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposrue with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] 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.
Maximum Risk Characterisation Ratio for Air Emissions [RCRair] 0.000037
Maximum Risk Characterisation Ratio for Wastewater Emissions [RCRwater] 0.00098

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ISO 14001	Yes	Yes
ISO 22000	Yes	Yes
FSSC 22000	Yes	Yes
GMP+ -feed	Yes	Yes
OHSAS18001	-	Yes
ESAD	Yes	Yes
other	-	AEO