

SAFETY DATA SHEET

SECTION 1	IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING
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This SDS meets the EU Safety Data Sheet requirements for this material, with the following exceptions: 1) Supplier address and relevant telephone numbers refer to an ExxonMobil Europe coordination center, but the actual supply may come from another affiliate of ExxonMobil in Europe; and 2) No country specific information is included.

1.1. PRODUCT IDENTIFIER

Product Name: MARINE DISTILLATES
Product Description: Hydrocarbons and Additives
Product Code: 708621-60

Trade Names	Trade Names
BUNKER	BUNKER GO .001%S -12CFPP(W) DYED
GASOIL	GASOIL MARINE WINTER (GOW)
LDO	MARINE DIESEL OIL
MARINE GASOIL	MARINE GASOIL (MGO)

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

Intended Use: Fuel

Identified Uses:

Manufacture of substance
Distribution of substance
Use as an intermediate
Formulation and (re)packing of substances and mixtures
Lubricants - Industrial
Use as a fuel - Industrial
Functional Fluids - Industrial
Use as a fuel - Professional
Use as a fuel - Consumer

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

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

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Supplier: Esso Petroleum Company Ltd.
Ermyn Way
Ermyn House
Leatherhead
KT22 8UX Surrey
Great Britain

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Supplier General Contact:

SDS Internet Address:

E-Mail:

(UK) (+44) (0) 1372 222 000

www.msds.exxonmobil.com

sds.uk@exxonmobil.com

1.4. EMERGENCY TELEPHONE NUMBER

24 Hour Emergency Telephone:

National Poison Control Centre:

(UK) (+44) (0) 1372 222 000

(UK) 111 / (IE) 01 809 2166

SECTION 2 HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

Classification according to Regulation (EC) No 1272/2008

Flammable liquid: Category 3.

Acute inhalation toxicant: Category 4. Skin irritation: Category 2. Carcinogen: Category 2. Specific target organ toxicant (repeated exposure): Category 2. Aspiration toxicant: Category 1.

Chronic aquatic toxicant: Category 2.

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled.

H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure.

Bone marrow, Liver, Thymus

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

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Hazard Statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled.

H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure. Bone marrow, Liver, Thymus

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements:

P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. 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. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. 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. P308 + P313: IF exposed or concerned: Get medical advice/attention. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P331: Do NOT induce vomiting. P332 + P313: If skin irritation occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish.

P391: Collect spillage.

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

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

Contains: Fuels, diesel

2.3. OTHER HAZARDS**Physical / Chemical Hazards:**

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

Health Hazards:

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

Environmental Hazards:

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

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3.1. SUBSTANCES Not Applicable. This material is regulated as a mixture.

3.2. MIXTURES

This material is defined as a mixture.

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

Name	CAS#	EC#	Registration#	Concentration *	GHS/CLP classification
Fuels, diesel	68334-30-5	269-822-7	01-2119484664-27	> 99%	[Aquatic Acute 2 H401], Aquatic Chronic 2 H411, Acute Tox. 4 H332, Asp. Tox. 1 H304, Carc. 2 H351, Flam. Liq. 3 H226, Skin Irrit. 2 H315, STOT RE 2 H373, Note N

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.

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

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

SECTION 4 FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES

INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

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

EYE CONTACT

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

INGESTION

Seek immediate medical attention. Do not induce vomiting.

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

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

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

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

SECTION 5	FIRE FIGHTING MEASURES
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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: Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulphur oxides

5.3. ADVICE FOR FIRE FIGHTERS

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

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: $\geq 60^{\circ}\text{C}$ (140°F) [Typical]

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

Autoignition Temperature: $>250^{\circ}\text{C}$ (482°F) [test method unavailable]

SECTION 6	ACCIDENTAL RELEASE MEASURES
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6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

NOTIFICATION PROCEDURES

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

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See

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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. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

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

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

6.4. REFERENCES TO OTHER SECTIONS

See Sections 8 and 13.

SECTION 7

HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING

Avoid all personal contact. Do not siphon by mouth. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). 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).

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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. Keep away from incompatible materials.

7.3. SPECIFIC END USES

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

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

EXPOSURE LIMIT VALUES

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

Substance Name	Form	Limit/Standard			Note	Source
Fuels, diesel	Stable Aerosol.	TWA	5 mg/m3		Skin	ExxonMobil
Fuels, diesel	Vapour.	TWA	200 mg/m3		Skin	ExxonMobil
Fuels, diesel [total hydrocarb, vapor&aerosol]	Inhalable fraction and vapour	TWA	100 mg/m3		Skin	ACGIH

Note: Information about recommended monitoring procedures can be obtained from the relevant agency(ies)/institute(s):

UK Health and Safety Executive (HSE)

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

Worker

Substance Name	Dermal	Inhalation
Fuels, diesel	2.9 mg/kg bw/day DNEL, Chronic Exposure, Systemic Effects	68 mg/m3 DNEL, Chronic Exposure, Systemic Effects

Consumer

Substance Name	Dermal	Inhalation	Oral
Fuels, diesel	1.3 mg/kg bw/day DNEL,	20 mg/m3 DNEL, Chronic	NA

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

PREDICTED NO EFFECT CONCENTRATION (PNEC)

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

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

8.2. EXPOSURE CONTROLS

ENGINEERING CONTROLS

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

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

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

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

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

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

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

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

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

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

Chemical/oil resistant clothing is recommended.

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

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

ENVIRONMENTAL CONTROLS

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

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
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Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Colour: Clear (May Be Dyed)

Odour: Petroleum/Solvent

Odour Threshold: No data available

pH: Not technically feasible

Melting Point: No data available

Freezing Point: No data available

Initial Boiling Point / and Boiling Range: > 180°C (356°F) [test method unavailable]

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

Evaporation Rate (n-butyl acetate = 1): No data available

Flammability (Solid, Gas): Not technically feasible

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

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unavailable]

Vapour Pressure: < 0.04 kPa (0.3 mm Hg) at 20 °C [test method unavailable]

Vapour Density (Air = 1): No data available

Relative Density (at 15 °C): 0.85 [test method unavailable]

Solubility(ies): water Negligible

Partition coefficient (n-Octanol/Water Partition Coefficient): > 3.5 [test method unavailable]

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

Decomposition Temperature: No data available

Viscosity: >=3 cSt (3 mm²/sec) at 40°C [test method unavailable]

Explosive Properties: None

Oxidizing Properties: None

9.2. OTHER INFORMATION

Density: 800 kg/m³ (6.68 lbs/gal, 0.8 kg/dm³) - 910 kg/m³ (7.59 lbs/gal, 0.91 kg/dm³) [test method unavailable]

SECTION 10 STABILITY AND REACTIVITY

10.1. REACTIVITY: See sub-sections below.

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

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

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

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

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 4100 mg/m ³ (Vapor and aerosol)	Moderately toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity (Rat): LD50 > 5000 mg/kg Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401
Skin	
Acute Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar

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Test scores or other study results do not meet criteria for classification.	materials. Test(s) equivalent or similar to OECD Guideline 434
Skin Corrosion/Irritation (Rabbit): Data available. Test scores or other study results meet criteria for classification.	Irritating to the skin. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation (Rabbit): Data available. Test scores or other study results do not meet criteria for classification.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
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 structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 475
Carcinogenicity: Data available.	Caused cancer in laboratory animals, but the relevance to humans is uncertain. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 451
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Concentrated, prolonged or deliberate exposure may cause organ damage. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 410 413

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Bone marrow, Liver, Thymus

Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Diesel fuel: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. Diesel exhaust fumes: Carcinogenic in animal tests. Inhalation exposures to exhaust for 2 years in test animals resulted in lung tumours and lymphoma. Extract of particulate produced skin tumours in test animals. Caused mutations in-vitro.

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

12.1. TOXICITY

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

12.2. PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

Majority of components -- Expected to degrade rapidly in air

12.3. BIOACCUMULATIVE POTENTIAL

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

12.4. MOBILITY IN SOIL

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

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

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

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

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

12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

ECOLOGICAL DATA

Ecotoxicity

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

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results: Basis
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Water	Ready Biodegradability	28 day(s)	Percent Degraded < 60 : similar material
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SECTION 13 DISPOSAL CONSIDERATIONS

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

13.1. WASTE TREATMENT METHODS

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

REGULATORY DISPOSAL INFORMATION

European Waste Code: 13 07 01*

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

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

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

SECTION 14 TRANSPORT INFORMATION

LAND (ADR/RID)

14.1. UN Number: 1202

14.2. UN Proper Shipping Name (Technical Name): GAS OIL

14.3. Transport Hazard Class(es): 3

14.4. Packing Group: III

14.5. Environmental Hazards: Yes

14.6. Special Precautions for users:

Proper Shipping Name Suffix: Special Provision 640M

Classification Code: F1

Label(s) / Mark(s): 3, EHS

Hazard ID Number: 30

Hazchem EAC: 3Y

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INLAND WATERWAYS (ADNR/ADN)

14.1. UN (or ID) Number: 1202
14.2. UN Proper Shipping Name (Technical Name): GAS OIL
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Hazard ID Number: 30
Label(s) / Mark(s): 3 (N2, F), EHS

SEA (IMDG)

14.1. UN Number: 1202
14.2. UN Proper Shipping Name (Technical Name): GAS OIL
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Marine Pollutant
14.6. Special Precautions for users:
Label(s): 3
EMS Number: F-E, S-E
Transport Document Name: **UN1202, GAS OIL, 3, PG III, (>=60°C c.c.), MARINE POLLUTANT**

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

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

AIR (IATA)

14.1. UN Number: 1202
14.2. UN Proper Shipping Name (Technical Name): GAS OIL
14.3. Transport Hazard Class(es): 3
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Label(s) / Mark(s): 3
Transport Document Name: UN1202, GAS OIL, 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 (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AICS, DSL, IECSC, KECI, PICCS, TCSI, TSCA

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

Applicable EU Directives and Regulations:

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

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
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IDENTIFIED USES:

Manufacture of substance (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU10, SU3, SU8, SU9)
 Distribution of substance (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, SU3, SU8, SU9)
 Use as an intermediate (PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b, SU3, SU8, SU9)
 Formulation and (re)packing of substances and mixtures (PROC1, PROC14, PROC15, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, SU10, SU3)
 Lubricants - Industrial (PROC1, PROC10, PROC13, PROC17, PROC18, PROC2, PROC3, PROC4, 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 as a fuel - Professional (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU22)
 Use as a fuel - Consumer (PC13, SU21)

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

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

Acronym	Full text
N/A	Not applicable
N/D	Not determined
NE	Not established
VOC	Volatile Organic Compound
AICS	Australian Inventory of Chemical Substances
AIHA WEEL	American Industrial Hygiene Association Workplace Environmental Exposure Limits

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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

Classification according to Regulation (EC) No 1272/2008

Classification according to Regulation (EC) No 1272/2008	Classification procedure
Aquatic Chronic 2; H411	Calculation
Carc. 2; H351	Bridging, structurally similar materials
Flam. Liq. 3; H226	Based on test data
Skin Irrit. 2; H315	Bridging, structurally similar materials
STOT RE 2; H373	Bridging, structurally similar materials

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
 Skin Irrit. 2 H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
 Acute Tox. 4 H332: Harmful if inhaled; Acute Tox Inh, Cat 4
 Carc. 2 H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2
 STOT RE 2 H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2
 [Aquatic Acute 2 H401]: Toxic to aquatic life; Acute Env Tox, Cat 2
 Aquatic Chronic 2 H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Composition: Component Table for REACH information was modified.
 GHS Physical Hazards - Header information was added.
 GHS Physical Hazards information was added.
 GHS Physical/Chemical Classification information was added.
 GHS Physical/Chemical Symbol information was added.
 GHS Precautionary Statements - Prevention information was modified.
 GHS Precautionary Statements - Response information was modified.
 GHS Precautionary Statements - Storage information was modified.
 Hazard Identification: Physical/Chemical Hazard information was modified.

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Section 01: Company Contact Methods information was modified.
Section 07: Handling and Storage - Handling information was modified.
Section 09: Flash Point °C(°F) information was modified.
Section 14: ADNR Technical Name - All information was deleted.
Section 14: ADNR Technical Name - Close parenthesis information was deleted.
Section 14: ADNR Technical Name - Open parenthesis information was deleted.
Section 14: EMS Number information was modified.
Section 14: Hazard Class information was modified.
Section 14: IATA Technical Name - All information was deleted.
Section 14: IATA Technical Name - Open parenthesis information was deleted.
Section 14: IATA Technical Name - Close parenthesis information was deleted.
Section 14: IMO Technical Name - All information was deleted.
Section 14: IMO Technical Name - Close parenthesis information was deleted.
Section 14: IMO Technical Name - Open parenthesis information was deleted.
Section 14: Label(s) information was modified.
Section 14: Proper Shipping Name information was modified.
Section 14: Transport Document Name information was modified.
Section 14: UN Number information was modified.
Section 16: Classification CLP/GHS Table information was modified.
Section 16: Code to PPEs information was modified.
Section 16: HCode Key information was modified.

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Internal Use Only

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

PPEC: CF

DGN: 7108458XEU (1018053)

ANNEX

Section 1 Exposure Scenario Title
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Title:

Manufacture of substance

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Use Descriptor	
Sector(s) of Use	SU10, SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC1
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 (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
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]	
Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/	
Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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 measures (skin irritants)	
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin	

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problems that may develop.

General exposures (closed systems) PROC1

No specific measures identified.

General exposures (closed systems) PROC2

Handle substance within a closed system.

General exposures (closed systems) PROC3

Handle substance within a closed system.

General exposures (open systems) PROC4

Wear suitable gloves tested to EN374.

Process sampling PROC3

No other specific measures identified.

Laboratory activities PROC15

No other specific measures identified.

Bulk transfers (closed systems) PROC8b

Handle substance within a closed system.

Wear suitable gloves tested to EN374.

Bulk transfers (open systems) PROC8b

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage PROC1

Store substance within a closed system.

Bulk product 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): 600000 tons/yr

Continuous release.

Emission Days (days/year): 300 days/yr

Fraction of EU tonnage used in region: 0.1

Fraction of Regional tonnage used Locally: 0.022

Maximum daily site tonnage (kg/d): 2000000 kg / day

Regional use tonnage (tonnes/year): 27000000 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): 0.0000025

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.

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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 =: >= 90.3 %
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: 94.5 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 3600000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %
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 exposure with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
4.2. Environment
Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e. RCRs >1), additional RMMs or a site-specific chemical safety assessment is required. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - 'Site-Specific Production' worksheet. [DSU6]

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Section 1 Exposure Scenario Title	
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	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 measures applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants)	

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Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

General exposures (closed systems) PROC1

No specific measures identified.

General exposures (closed systems) PROC2

Handle substance within a closed system.

General exposures (closed systems) PROC3

Handle substance within a closed system.

General exposures (open systems) PROC4

Wear suitable gloves tested to EN374.

Process sampling PROC3

No specific measures identified.

Laboratory activities PROC15

No specific measures identified.

Bulk transfers (closed systems) PROC8b

Handle substance within a closed system.

Wear suitable gloves tested to EN374.

Bulk transfers (open systems) PROC8b

Wear suitable gloves tested to EN374.

Drum and small package filling PROC9

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Storage PROC1

Handle substance within a closed system.

Storage PROC2

Handle 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): 67000 tons/yr

Continuous release.

Emission Days (days/year): 300 days/yr

Fraction of EU tonnage used in region: 0.1

Fraction of Regional tonnage used Locally: 0.002

Maximum daily site tonnage (kg/d): 220000 kg / day

Regional use tonnage (tonnes/year): 34000000 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.

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<p>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</p> <p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 % 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 =: 75.3 %</p>
<p>Organisation measures to prevent/limit release from site</p> <p>Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.</p>
<p>Conditions and measures related to municipal sewage treatment plant</p> <p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m³/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.5 % The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 1000000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p> <p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p> <p>External recovery an recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p>Section 3 Exposure Estimation</p>
<p>3.1. Health</p> <p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p>3.2. Environment</p> <p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p>Section 4 Guidance to check compliance with the Exposure Scenario</p>
<p>4.1. Health</p> <p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p>4.2. Environment</p> <p>Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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Section 1 Exposure Scenario Title	
Title:	
Use as an intermediate	
Use Descriptor	
Sector(s) of Use	SU3, SU8, SU9
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC4, PROC8a, PROC8b
Environmental Release Categories	ERC6A
Specific Environmental Release Category	ESVOC 6.1a.v1
Processes, tasks, activities covered	
Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
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]	
Operation is carried out at elevated temperature (>20 C above ambient temperature)[OC7]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
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 applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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.	

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General measures (skin irritants)

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

General exposures (closed systems) PROC1

No specific measures identified.

General exposures (closed systems) PROC2

Handle substance within a closed system.

General exposures (closed systems) PROC3

Handle substance within a closed system.

General exposures (open systems) PROC4

Wear suitable gloves tested to EN374.

Process sampling PROC3

No specific measures identified.

Laboratory activities PROC15

No specific measures identified.

Bulk transfers (open systems) PROC8b

Wear suitable gloves tested to EN374.

Bulk transfers (closed systems) PROC8b

Handle substance within a closed system.

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage PROC1

Store substance within a closed system.

Bulk product 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): 15000 tons/yr

Continuous release.

Emission Days (days/year): 300 days/yr

Fraction of EU tonnage used in region: 0.1

Fraction of Regional tonnage used Locally: 0.0091

Maximum daily site tonnage (kg/d): 50000 kg / day

Regional use tonnage (tonnes/year): 1700000 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): 0.001

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

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<p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.</p> <p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 %</p> <p>Risk from environmental exposure is driven by freshwater sediment.</p> <p>Treat air emissions to provide a typical removal (or abatement?) efficiency of: 80 %</p> <p>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 93 %</p>
<p>Organisation measures to prevent/limit release from site</p> <p>Do not apply industrial sludge to natural soils.</p> <p>Prevent discharge of undissolved substance to or recover from wastewater.</p> <p>Sludge should be incinerated, contained or reclaimed.</p>
<p>Conditions and measures related to municipal sewage treatment plant</p> <p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day</p> <p>Estimated substance removal from wastewater via domestic sewage treatment is: 94.5 %</p> <p>Not applicable as there is no release to wastewater.</p> <p>The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 64000 kg / day</p> <p>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p> <p>This substance is consumed during use and no waste of the substance is generated [ETW5]</p>
<p>Conditions and measures related to external recovery of waste</p> <p>This substance is consumed during use and no waste of the substance is generated [ERW3]</p>
<p>Section 3 Exposure Estimation</p>
<p>3.1. Health</p> <p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p>3.2. Environment</p> <p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p>Section 4 Guidance to check compliance with the Exposure Scenario</p>
<p>4.1. Health</p> <p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]</p> <p>Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]</p> <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]</p> <p>Risk Management Measures are based on qualitative risk characterisation. [G37]</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p>4.2. Environment</p> <p>Further details on scaling and control technologies are provided in factsheet</p> <p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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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, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
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 measures (skin irritants)	
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	
General measures applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to	

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breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

General exposures (closed systems) PROC1

No specific measures identified.

General exposures (closed systems) PROC2

Handle substance within a closed system.

General exposures (closed systems) PROC3

Handle substance within a closed system.

General exposures (open systems) PROC4

Wear suitable gloves tested to EN374.

Process sampling PROC3

No specific measures identified.

Laboratory activities PROC15

No specific measures identified.

Bulk transfers PROC8b

Use drum pumps or carefully pour from container.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Mixing operations (open systems) PROC5

Provide extract ventilation to points where emissions occur.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Drum/batch transfers PROC8b

Wear suitable gloves tested to EN374.

Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC14

Wear suitable gloves tested to EN374.

Drum and small package filling PROC9

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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): 30000 tons/yr

Continuous release.

Emission Days (days/year): 300 days/yr

Fraction of EU tonnage used in region: 0.1

Fraction of Regional tonnage used Locally: 0.00094

Maximum daily site tonnage (kg/d): 100000 kg / day

Regional use tonnage (tonnes/year): 32000000 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

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<p>Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): [OOC11] 0.01</p> <p>Release fraction to soil from process (initial release prior to RMM): 0.0001</p> <p>Release fraction to wastewater from process (initial release prior to RMM): 0.000018</p>
<p>Technical conditions and measures at process level (source) to prevent release</p>
<p>Common practices vary across sites thus conservative process release estimates used.</p>
<p>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</p>
<p>If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.</p> <p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq 0\%$</p> <p>Risk from environmental exposure is driven by freshwater sediment.</p> <p>Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0%</p> <p>Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of $\geq 94\%$</p>
<p>Organisation measures to prevent/limit release from site</p>
<p>Do not apply industrial sludge to natural soils.</p> <p>Prevent discharge of undissolved substance to or recover from wastewater.</p> <p>Sludge should be incinerated, contained or reclaimed.</p>
<p>Conditions and measures related to municipal sewage treatment plant</p>
<p>Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m³/day</p> <p>Estimated substance removal from wastewater via domestic sewage treatment is: 94.5%</p> <p>Not applicable as there is no release to wastewater.</p> <p>The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 110000 kg / day</p> <p>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5%</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste</p>
<p>External recovery or recycling of waste should comply with applicable local and/or national regulations [ERW1]</p>
<p>Section 3 Exposure Estimation</p>
<p>3.1. Health</p>
<p>The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>
<p>3.2. Environment</p>
<p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.[EE2]</p>
<p>Section 4 Guidance to check compliance with the Exposure Scenario</p>
<p>4.1. Health</p>
<p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]</p> <p>Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]</p> <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]</p> <p>Risk Management Measures are based on qualitative risk characterisation. [G37]</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]</p>
<p>4.2. Environment</p>
<p>Further details on scaling and control technologies are provided in factsheet</p> <p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>

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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 applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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 measures (skin irritants)	

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Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

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.

General exposures (open systems) PROC4

Provide extract ventilation to points where emissions occur.

Bulk transfers PROC8b

Handle substance within a closed system.

Wear suitable gloves tested to EN374.

Filling / preparation of equipment from drums or containers PROC8a

Wear suitable gloves tested to EN374.

Filling / preparation of equipment from drums or containers PROC8b

Wear suitable gloves tested to EN374.

Initial factory fill of equipment PROC9

Wear suitable gloves tested to EN374.

Operation and lubrication of high energy open equipment PROC17

Provide extract ventilation to points where emissions occur.

Restrict area of openings to equipment.

Operation and lubrication of high energy open equipment PROC18

Provide extract ventilation to points where emissions occur.

Restrict area of openings to equipment.

Roller application or brushing PROC10

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Treatment by dipping and pouring PROC13

Wear suitable gloves tested to EN374.

Spraying PROC7

Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Wear suitable gloves (tested to EN374), coverall and eye protection.

Maintenance (of larger plant items) and machine set up PROC8b

Wear suitable gloves tested to EN374.

Maintenance (of larger plant items) and machine set up Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC8b

Ensure material transfers are under containment or extract ventilation.

Provide extract ventilation to emission points when contact with warm (> 50°C) lubricant is likely.

Wear suitable gloves tested to EN374.

Maintenance of small items PROC8a

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Remanufacture of reject articles PROC9

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Storage PROC1

Store substance within a closed system.

Storage PROC2

Store substance within a closed system.

Section 2.2 Control of environmental exposure

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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: 0.028 Maximum daily site tonnage (kg/d): 5000 kg / day Regional use tonnage (tonnes/year): 3500 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, 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: 70 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 57.9 %
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: 94.5 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 39000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %
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 enable the derivation of a DNEL for dermal irritant effects. [G32]

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Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]
Risk Management Measures are based on qualitative risk characterisation. [G37]
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]

4.2. Environment

Further details on scaling and control technologies are provided in factsheet
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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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 applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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 measures (skin irritants)	
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if	

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hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Bulk transfers PROC8b

Wear suitable gloves tested to EN374.

Drum/batch transfers PROC8b

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Vessel and container cleaning PROC8a

Apply vessel entry procedures including use of supplied compressed air.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Storage PROC1

Store substance within a closed system.

Storage PROC2

Store substance within a closed system.

Use as a fuel PROC1

No specific measures identified.

Use as a fuel PROC2

No specific measures identified.

Use as a fuel (closed systems) PROC16

No specific measures identified.

Use as a fuel (closed systems) PROC3

No 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): 1500000 tons/yr

Continuous release.

Emission Days (days/year): 300 days/yr

Fraction of EU tonnage used in region: 0.1

Fraction of Regional tonnage used Locally: 0.35

Maximum daily site tonnage (kg/d): 5000000 kg / day

Regional use tonnage (tonnes/year): 4300000 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, 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.

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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 =: >= 62.4 %
Organisation measures to prevent/limit release from site
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m3/day Estimated substance removal from wastewater via domestic sewage treatment is: 94.5 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 34000000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %
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] 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 exposure with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32] Available hazard data do not support the need for a DNEL to be established for other health effects.[G36] Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22] Risk Management Measures are based on qualitative risk characterisation. [G37] Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
4.2. Environment
Further details on scaling and control technologies are provided in factsheet Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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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 applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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 measures (skin irritants)	

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Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Bulk transfers (closed systems) PROC1

No specific measures identified.

Bulk transfers (closed systems) PROC2

No specific measures identified.

Drum/batch transfers PROC8b

Wear suitable gloves tested to EN374.

Filling of articles/equipment (closed systems) PROC9

Transfer via enclosed lines

Filling / preparation of equipment from drums or containers PROC8a

Wear suitable gloves tested to EN374.

General exposures (closed systems) PROC2

Ensure operatives are trained to minimise exposures.

General exposures (open systems) PROC4

Wear suitable gloves tested to EN374.

General exposures (open systems) Operation is carried out at elevated temperature (> 20°C above ambient temperature). PROC4

Use dry break couplings for material transfer.

Remanufacture of reject articles PROC9

Wear suitable gloves tested to EN374.

Equipment maintenance PROC8a

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Storage PROC1

Store substance within a closed system.

Storage PROC2

Store substance within a closed system.

Bulk transfers (closed systems) PROC3

No 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: 0.76
Maximum daily site tonnage (kg/d): 500 kg / day
Regional use tonnage (tonnes/year): 13 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

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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 \geq 0 %
Risk from environmental exposure is driven by freshwater sediment.
Treat air emissions to provide a typical removal (or abatement?) efficiency of: 0 %
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of \geq 55.9 %
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 m ³ /day
Estimated substance removal from wastewater via domestic sewage treatment is: 94.5 %
The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 4000 kg / day
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %
Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]
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 exposure with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]
Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]
Risk Management Measures are based on qualitative risk characterisation. [G37]
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
4.2. Environment
Further details on scaling and control technologies are provided in factsheet
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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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 applicable to all activities	
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
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 measures (skin irritants)	
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if	

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hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Bulk transfers PROC8b

Wear suitable gloves tested to EN374.

Drum/batch transfers PROC8b

Use drum pumps or carefully pour from container.

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance PROC8a

Drain down and flush system prior to equipment break-in or maintenance.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Vessel and container cleaning PROC8a

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Storage PROC1

Store substance within a closed system.

Use as a fuel (closed systems) PROC3

No specific measures identified.

Use as a fuel (closed systems) PROC16

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

or

Ensure operation is undertaken outdoors.

refuelling PROC8b

Wear suitable gloves tested to EN374.

Use as a fuel PROC1

No specific measures identified.

Use as a fuel PROC2

No 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): 3600 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): 9900 kg / day

Regional use tonnage (tonnes/year): 7200000 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 wide dispersive use (regional only): 0.0001

Release fraction to soil from wide dispersive use (regional only): 0.00001

Release fraction to wastewater from wide dispersive use: 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, no onsite wastewater treatment required.

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >=

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0 %
Risk from environmental exposure is driven by freshwater sediment.
Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of $\geq 67.2\%$
Organisation measures to prevent/limit release from site
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant
Assumed domestic sewage treatment plant effluent flow is:[STP5] 2000 m ³ /day
Estimated substance removal from wastewater via domestic sewage treatment is: 94.5 %
The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 59000 kg / day
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 94.5 %
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]
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 exposure with the Petrorisk model.[EE2]
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. [G32]
Available hazard data do not support the need for a DNEL to be established for other health effects.[G36]
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. [G22]
Risk Management Measures are based on qualitative risk characterisation. [G37]
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
4.2. Environment
Further details on scaling and control technologies are provided in factsheet
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

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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)	
<p>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.</p> <p>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.</p> <p>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. 0.6 Air changes per hour Covers use in room size of 100 m³ Covers exposure up to 0.05 hour(s) Liquid, vapour pressure < 0,5 kPa at STP.</p> <p>Liquid, Garden Equipment - Use PC13 Covers concentrations up to 100 %</p>	

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<p>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. 0.6 Air changes per hour Covers use in room size of 100 m³ Covers exposure up to 2 hour(s) Liquid, vapour pressure < 0,5 kPa at STP. Covers skin contact area up to 420 cm² Liquid: Garden Equipment - Refueling PC13 Covers concentrations up to 100 % Covers use up to 26 days/yr Covers use up to 1 times per day 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. 1.5 Air changes per hour Covers use in room size of 34 m³ Covers exposure up to 0.03 hour(s) Liquid, vapour pressure < 0,5 kPa at STP.</p>
<p>Section 2.2 Control of environmental exposure</p>
<p>Product characteristics Predominantly hydrophobic. Substance is complex UVCB.</p>
<p>Duration, frequency and amount Annual site tonnage (tonnes/year): 9700 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): 27000 kg / day Regional use tonnage (tonnes/year): 19000000 tons/yr</p>
<p>Environmental factors not influenced by risk management Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
<p>Other given operational conditions affecting environmental exposure Release fraction to air from wide dispersive use (regional only): 0.0001 Release fraction to soil from wide dispersive use (regional only): 0.00001 Release fraction to wastewater from wide dispersive use: 0.00001</p>
<p>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: 94.5 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 110000 kg / day</p>
<p>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] External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]</p>
<p>Conditions and measures related to external recovery of waste This substance is consumed during use and no waste of the substance is generated [ERW3]</p>
<p>Section 3 Exposure Estimation</p>
<p>3.1. Health</p>
<p>The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.[G30]</p>

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3.2. Environment

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

Section 4 Guidance to check compliance with the Exposure Scenario
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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]
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Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.[G23]
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4.2. Environment

Further details on scaling and control technologies are provided in factsheet

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