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SAFETY DATA SHEET

SECTION 1	IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING
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As of the revision date above, this SDS meets the regulations in the United Kingdom excluding Northern Ireland.

1.1. PRODUCT IDENTIFIER

Product Name: EXXONMOBIL PREMIUM AFME 200
Product Description: Hydrocarbons and Additives
Product Code: 709437-60

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

Intended Use: Fuel

Identified Uses:

Manufacture of substance
Distribution of substance
Use as an intermediate
Formulation and (re)packing of substances and mixtures
Use as a fuel - Industrial
Use as a fuel - Professional
Road and construction applications

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
KT22 8UX LEATHERHEAD, SURREY
Great Britain

Supplier General Contact: (UK) (+44) (0) 1372 222 000
SDS Internet Address: www.msds.exxonmobil.com
E-Mail: sds.uk@exxonmobil.com

1.4. EMERGENCY TELEPHONE NUMBER

24 Hour Emergency Telephone: (UK) (+44) (0) 1372 222 000
National Poison Control Centre: (UK) 111

SECTION 2	HAZARDS IDENTIFICATION
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2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

Classification according to CLP

Skin irritation: Category 2., H315: Causes skin irritation.

Acute inhalation toxicant: Category 4., H332: Harmful if inhaled.

Carcinogen: Category 1B., H350: May cause cancer.

Reproductive toxicant (developmental): Category 2., H361d: Suspected of damaging the unborn child.

Specific target organ toxicant (repeated exposure): Category 2., H373: May cause damage to organs through prolonged or repeated exposure.

Acute aquatic toxicant: Category 1., H400: Very toxic to aquatic life.

Chronic aquatic toxicant: Category 1., H410: Very toxic to aquatic life with long lasting effects.

2.2. LABEL ELEMENTS

Label elements according to CLP

Pictograms:



Signal Word: Danger

Hazard Statements:

Health:

H315: Causes skin irritation.

H332: Harmful if inhaled.

H350: May cause cancer.

H361d: Suspected of damaging the unborn child.

H373: May cause damage to organs through prolonged or repeated exposure. (Blood, Bone marrow, Liver, Thymus).

Environment:

H410: Very toxic to aquatic life with long lasting effects.

Supplemental:

EUH066: Repeated exposure may cause skin dryness or cracking.

Precautionary Statements:

Prevention:

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe mist / vapours.

P264: Wash skin thoroughly after handling.

P271: Use only outdoors or in a well-ventilated area.

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P273: Avoid release to the environment.
 P280: Wear protective gloves and clothing.

Response:

P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
 P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P308 + P313: IF exposed or concerned: Get medical advice/ attention.
 P312: Call a POISON CENTRE or doctor/physician if you feel unwell.
 P332 + P313: If skin irritation occurs: Get medical advice/ attention.
 P362 + P364: Take off contaminated clothing and wash it before reuse.
 P391: Collect spillage.

Storage:

P405: Store locked up.

Disposal:

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

Contains: Fuels, diesel; Gas oils (petroleum), heavy vacuum

2.3. OTHER HAZARDS

Physical / Chemical Hazards:

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

Health Hazards:

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. Hydrogen sulphide, a highly toxic gas, may be present. Signs and symptoms of overexposure to hydrogen sulphide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odour does not provide a reliable indicator of the presence of hazardous levels in the atmosphere. May be irritating to the eyes, nose, throat, and lungs. Repeated exposure may cause skin dryness or cracking.

Environmental Hazards:

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

SECTION 3	COMPOSITION / INFORMATION ON INGREDIENTS
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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	35 - 45%	[Aquatic Acute 2 H401], Aquatic Chronic 2 H411,

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					[Flam. Liq. 4 H227], Acute Tox. 4 H332, Asp. Tox. 1 H304, Carc. 2 H351, Skin Irrit. 2 H315, STOT RE 2 H373
Gas oils (petroleum), heavy vacuum	64741-57-7	265-058-3	01-2119487294-29	55 - 65%	Acute Tox. 4 H332, Carc. 1B H350, EUH066, Repr. 2 H361d, Aquatic Acute 1 H400 (M factor 1), Aquatic Chronic 1 H410 (M factor 1), STOT RE 2 H373

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

Reportable hazardous constituent(s) contained in UVCB- and/or multi-constituent substance(s) complying with the classification criteria and/or with an exposure limit (OEL)

Name	CAS#	EC#	Concentration *	GHS/CLP Classification
hydrogen sulphide	7783-06-4	231-977-3	< 0.1%	Acute Tox. 2 H330, Flam. Gas 1 H220, Press. Gas H280, Aquatic Acute 1 H400 (M factor 1)

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

* 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
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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

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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. Respiratory and eye irritation, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Fatigue, difficulty sleeping, irritability and gastrointestinal problems. Local necrosis as evidenced by delayed onset of pain and tissue damage a few hours after injection. Redness, dry cracking of skin.

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

Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

SECTION 5 FIRE FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Suitable Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (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, Hydrogen sulphide, 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]: 92°C (198°F) [Typical]

Upper/Lower Flammable Limits (Approximate volume % in air): UEL: 6.0 LEL: 1.0 [test method unavailable]

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

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

NOTIFICATION PROCEDURES

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

PROTECTIVE MEASURES

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

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, 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. Residual fuel oils may require heating and other forms of pre-treatment before use and will normally be stored and handled in facilities fitted with heating systems. Users should ensure their

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facilities are capable of storing and handling these fuels at or just above an appropriate temperature. Proper temperatures for storage and handling will depend on a number of factors such as the viscosity of the fuel and the specific requirements of the heating plant or engine that will consume the fuel. Users should consult the fuel supplier on appropriate storage and handling temperatures. Do not siphon by mouth. Harmful amounts of H₂S may be present. The toxic and olfactory (sense of smell) fatigue properties of hydrogen sulfide require that air monitoring alarms and respiratory protection be used where the concentration might be expected to reach a harmful level, such as in an enclosed space, heated transport vessel, or in a spill or leak situation.

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

Static Accumulator: This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10⁻¹² 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
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8.1. CONTROL PARAMETERS

EXPOSURE LIMIT VALUES

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

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

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Fuels, diesel	NA	NA	NA	NA	NA	NA	NA
Gas oils (petroleum), heavy vacuum	NA	NA	NA	NA	NA	NA	66.7 mg / kg (food)

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:

Positive-pressure, air-supplied respirator in areas where H₂S vapours may accumulate is recommended.

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

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

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

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protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

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

ENVIRONMENTAL CONTROLS

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

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Colour: Brown
Odour: Petroleum/Solvent
Odour Threshold: No data available
pH: No data available
Melting Point: Not technically feasible
Freezing Point: No data available
Initial Boiling Point / and Boiling Range: > 180°C (356°F) [test method unavailable]
Flash Point [Method]: 92°C (198°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: 6.0 LEL: 1.0 [test method unavailable]
Vapour Pressure: < 0.04 kPa (0.3 mm Hg) at 20 °C [test method unavailable]
Vapour Density (Air = 1): > 2 at 101 kPa [test method unavailable]
Relative Density (at 15 °C): 0.8 - 0.92 [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: [N/D at 40 °C] | 50 cSt (50 mm²/sec) at 50°C [test method unavailable]
Explosive Properties: None
Oxidizing Properties: None

9.2. OTHER INFORMATION

Pour Point: < 6°C (43°F) [test method unavailable]

SECTION 10 STABILITY AND REACTIVITY

10.1. REACTIVITY: See sub-sections below.

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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: Alkalies, Halogens, Strong Acids, Strong Bases, Strong oxidisers

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

SECTION 11	TOXICOLOGICAL INFORMATION
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11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Moderately toxic. Based on assessment of the components.
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: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Irritating to the skin. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Caused cancer in laboratory animals. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Caused damage to the fetus in laboratory animals, but the relevance to humans is uncertain. Based on assessment of the components.
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: No end point data for	Contains a substance that may cause damage to organs from

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material.	prolonged or repeated exposure. Based on assessment of the components.
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TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
hydrogen sulphide	Inhalation Lethality: 4 hour(s) LC50 444 ppm (Gas) (Rat)

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Blood, 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 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.

Contains:

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. HYDROGEN SULPHIDE: Chronic health effects due to repeated exposures to low levels of H₂S have not been established. High level (700 ppm) acute exposure can result in sudden death. High concentrations will lead to cardiopulmonary arrest due to nervous system toxicity and pulmonary edema. Lower levels (150 ppm) may overwhelm sense of smell, eliminating warning of exposure. Symptoms of overexposure to H₂S include headache, fatigue, insomnia, irritability, and gastrointestinal problems. Repeated exposures to approximately 25 ppm will irritate mucous membranes and the respiratory system and have been implicated in some eye damage.

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

12.1. TOXICITY

Material -- Expected to be very 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:

More volatile component -- 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.

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12.4. MOBILITY IN SOIL

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

High molecular wt. 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)

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

12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

SECTION 13	DISPOSAL CONSIDERATIONS
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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.

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

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

SECTION 14	TRANSPORT INFORMATION
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LAND (ADR/RID)

14.1. UN Number: 3082

14.2. UN Proper Shipping Name (Technical Name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEAVY VACUUM GAS OIL)

14.3. Transport Hazard Class(es): 9

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14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Classification Code: M6
Label(s) / Mark(s): 9, EHS
Hazard ID Number: 90
Hazchem EAC: 3Z

INLAND WATERWAYS (ADN)

14.1. UN (or ID) Number: 3082
14.2. UN Proper Shipping Name (Technical Name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEAVY VACUUM GAS OIL)
14.3. Transport Hazard Class(es): 9
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Hazard ID Number: 90
Label(s) / Mark(s): 9 (CMR, N1, F), EHS

SEA (IMDG)

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

Footnote: Not subject to the provisions of UN3082 Environmentally hazardous substances liquid, n.o.s., if shipped in quantities of 5 liters or less per single or inner combination packaging as per IMDG code 2.10.2.7.

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

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

AIR (IATA)

14.1. UN Number: 3082
14.2. UN Proper Shipping Name (Technical Name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEAVY VACUUM GAS OIL)
14.3. Transport Hazard Class(es): 9
14.4. Packing Group: III
14.5. Environmental Hazards: Yes
14.6. Special Precautions for users:
Label(s) / Mark(s): 9, EHS

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Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (HEAVY VACUUM GAS OIL), 9, PG III

[Footnote: Not subject to the provisions of UN3082 Environmentally hazardous substances liquid, n.o.s., if shipped in quantities of 5 liters or less per single or inner combination packaging as per Special Provision A197.]

SECTION 15 REGULATORY INFORMATION

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

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

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

Applicable UK legislation:

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

Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles identified in REACH [... Registration, Evaluation, Authorisation and Restrictions of Chemicals ... and amendments thereto]

Health and Safety at Work etc. Act [...pregnant workers...recently given birth...breastfeeding ...]

Health and Safety at Work etc. Act [... protection of young people at work ...]

The Control of Major Accident Hazards (COMAH) Regulations. Product contains a substance that falls within the criteria. Refer to legislation for details of requirements taking into account the volume of product stored on site.

The Control of Substances Hazardous to Health (COSHH) Regulations [... protection of workers from the risks related to carcinogens or mutagens...]

The Control of Substances Hazardous to Health (COSHH) Regulations [...protection of workers from the risks of chemical agents at work...]. Refer to legislation for details of requirements.

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

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

The following entries of Annex XVII may be considered for this product: 03, 28

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, PROC2, PROC3, PROC8a, PROC8b, SU10, SU3, SU8, SU9)
- Distribution of substance (PROC3, PROC8a, PROC8b, SU3, SU8, SU9)
- Use as an intermediate (PROC1, PROC15, PROC2, PROC3, PROC8a, PROC8b, SU3, SU8, SU9)
- Formulation and (re)packing of substances and mixtures (PROC1, PROC15, PROC2, PROC3, PROC8a, PROC8b, SU10, SU3)
- Use as a fuel - Industrial (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU3)
- Use as a fuel - Professional (PROC1, PROC16, PROC2, PROC3, PROC8a, PROC8b, SU22)
- Road and construction applications (PROC8a, PROC8b, SU22)

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

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

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

Classification according to CLP

Classification according to CLP	Classification procedure
Aquatic Acute 1; H400	Calculation
Aquatic Chronic 1; H410	Calculation
Carc. 1B; H350	Calculation
Repr. 2; H361d	Calculation

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Skin Irrit. 2; H315	Calculation
STOT RE 2; H373	Calculation

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

Flam. Gas 1 H220: Extremely flammable gas; Flammable Gas, Cat 1
 [Flam. Liq. 4 H227]: Combustible liquid; Flammable Liquid, Cat 4
 Press. Gas H280: Contains gas under pressure; may explode if heated; Pressurized Gas
 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. 2 H330: Fatal if inhaled; Acute Tox Inh, Cat 2
 Acute Tox. 4 H332: Harmful if inhaled; Acute Tox Inh, Cat 4
 Carc. 1B H350: May cause cancer; Carcinogenicity, Cat 1B
 Carc. 2 H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2
 Repr. 2 H361d: Suspected of damaging the unborn child; Repro Tox, Cat 2 (Develop)
 STOT RE 2 H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2
 Aquatic Acute 1 H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
 [Aquatic Acute 2 H401]: Toxic to aquatic life; Acute Env Tox, Cat 2
 Aquatic Chronic 1 H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
 Aquatic Chronic 2 H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2
 EUH066: Repeated exposure may cause skin dryness or cracking.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

CLP Classification information was added.
 dnel table notes information was modified.
 Formulation and (re)packing of substances and mixtures: Annex Information information was modified.
 GHS CLP Supplemental Statements information was added.
 GHS CLP Supplemental Statements information was deleted.
 GHS Environmental Classification information was deleted.
 GHS Environmental Hazards information was added.
 GHS Environmental Hazards information was deleted.
 GHS Environmental Symbol information was deleted.
 GHS Health Classification information was deleted.
 GHS Health Hazards information was added.
 GHS Health Hazards information was deleted.
 GHS Health Symbol information was deleted.
 GHS Precautionary Statements - Disposal information was added.
 GHS Precautionary Statements - Disposal information was deleted.
 GHS Precautionary Statements - Prevention information was added.
 GHS Precautionary Statements - Prevention information was deleted.
 GHS Precautionary Statements - Response information was added.
 GHS Precautionary Statements - Response information was deleted.
 GHS Precautionary Statements - Storage information was added.
 GHS Precautionary Statements - Storage information was deleted.
 GHS Signal Word information was added.
 GHS Signal Word information was deleted.
 GHS Symbol information was added.
 GHS Target Organ List information was deleted.
 GHS Target Organ Phrase information was deleted.

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- Hazard Identification: Health Hazards information was modified.
- Hazard Identification: Section 3 Footnotes for CLP tables information was modified.
- Manufacture of substance: Annex Information information was modified.
- Section 09: Flammable Limits - LEL information was modified.
- Section 09: Flammable Limits - UEL information was modified.
- Section 09: Viscosity information was modified.
- Section 11: Target Organ Toxicity - Repeat Conclusion information was modified.
- Section 13: European Waste Code Hazardous Note information was modified.
- Section 14: IATA Footnote information was added.
- Section 14: IMDG Footnote information was added.
- Section 15: EU Directives and Regulations information was modified.
- Section 15: National Chemical Inventory Listing information was modified.
- Section 15: REACH Annex XVII data information was added.
- Section 16: HCode Key information was modified.

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 MHC: 1A, 0, 2, 0, 4, 1 PPEC: C
 DGN: 7136898XGB (1022826)

ANNEX

Section 1 Exposure Scenario Title	
Title:	
Manufacture of substance	
Use Descriptor	
Sector(s) of Use	SU10, SU3, SU8, SU9
Process Categories	PROC1, PROC2, PROC3, 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 (ncluding marine vessel/barge, road/rail car and bulk	

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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)
<p>General measures (carcinogens) Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.</p> <p>General exposures (closed systems) PROC1 Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>General exposures (closed systems) Process sampling Outdoor. PROC2 Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>General exposures (closed systems) PROC3 Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>Bulk product storage PROC2 Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Store substance within a closed system.</p> <p>Road tanker/rail car loading PROC8b Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>marine vessel/barge (un)loading PROC8b Avoid carrying out activities involving exposure for more than 4 hours. Transfer via enclosed lines Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>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 specific activity training. Retain drain downs in sealed storage pending disposal or for subsequent recycle.</p>

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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: 0.039 Maximum daily site tonnage (kg/d): 2000000 kg / day Regional use tonnage (tonnes/year): 15000000 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM): 0.0001 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.00000075
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: 0 % Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: 90 % Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: 87.3 %
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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 2300000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 89 %
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

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4.1. Health

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects[G33]

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

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Section 1 Exposure Scenario Title	
Title:	
Distribution of substance	
Use Descriptor	
Sector(s) of Use	SU3, SU8, SU9
Process Categories	PROC3, PROC8a, PROC8b
Environmental Release Categories	ERC4, ERC6A, ERC6B, ERC6C, ERC6D, ERC7
Specific Environmental Release Category	
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 exposures (closed systems) PROC3	
Handle substance within a closed system.	
Avoid carrying out activities involving exposure for more than 4 hours.	
Sample via a closed loop or other system to avoid exposure.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
marine vessel/barge (un)loading PROC8b	
Avoid carrying out activities involving exposure for more than 4 hours.	
Transfer via enclosed lines	
Clear transfer lines prior to de-coupling.	
Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Road tanker/rail car loading PROC8b	
Ensure material transfers are under containment or extract ventilation.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
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 specific activity training.	
Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Section 2.2 Control of environmental exposure	
Product characteristics	
Not applicable	
Duration, frequency and amount	
Not applicable	
Environmental factors not influenced by risk management	
Not applicable	

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Other given operational conditions affecting environmental exposure
Not applicable
Technical conditions and measures at process level (source) to prevent release
Not applicable
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Not applicable
Organisation measures to prevent/limit release from site
Not applicable
Conditions and measures related to municipal sewage treatment plant
Not applicable
Conditions and measures related to external treatment of waste for disposal
Not applicable
Conditions and measures related to external recovery of waste
Not applicable
Section 3 Exposure Estimation
3.1. Health
Not applicable
3.2. Environment
Not applicable
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Not applicable
4.2. Environment
Not applicable

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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, 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 (carcinogens)	
Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
General exposures (closed systems) PROC1	
Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) Process sampling Outdoor. PROC2	
Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) PROC3	
Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Bulk product storage PROC2	
Store substance within a closed system. Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

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Laboratory activities PROC15

Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
 Wear suitable gloves tested to EN374.

marine vessel/barge (un)loading PROC8b

Avoid carrying out activities involving exposure for more than 4 hours.
 Transfer via enclosed lines

Clear transfer lines prior to de-coupling.
 Retain drain downs in sealed storage pending disposal or for subsequent recycle.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Road tanker/rail car loading PROC8b

Avoid carrying out activities involving exposure for more than 1 hour.
 or

Ensure material transfers are under containment or extract ventilation.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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 specific activity training.
 Retain drain downs in sealed storage pending disposal or for subsequent recycle.

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: 0.0014
 Maximum daily site tonnage (kg/d): 50000 kg / day
 Regional use tonnage (tonnes/year): 11000000 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): 0.00001
 Release fraction to soil from process (initial release prior to RMM): 0.001
 Release fraction to wastewater from process (initial release prior to RMM): 0.0000068

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 \geq 0 %
 Risk from environmental exposure is driven by freshwater sediment.
 Treat air emissions to provide a typical removal (or abatement?) efficiency of: 80 %
 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of \geq 88.3 %

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.

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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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 53000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 89 %
Conditions and measures related to external treatment of waste for disposal
This substance is consumed during use and no waste of the substance is generated [ETW5]
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 carcinogenic effects[G33] 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:	
Formulation and (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	SU10, SU3
Process Categories	PROC1, PROC15, PROC2, PROC3, PROC8a, PROC8b
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 (carcinogens)	
Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
General exposures (closed systems) PROC1	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) Process sampling PROC2	
Handle substance within a closed system.	
Sample via a closed loop or other system to avoid exposure.	
Avoid carrying out activities involving exposure for more than 15 minutes.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) PROC3	
Handle substance within a closed system.	
Sample via a closed loop or other system to avoid exposure.	
Avoid carrying out activities involving exposure for more than 4 hours.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Bulk product storage PROC2	
Store substance within a closed system.	
Avoid carrying out activities involving exposure for more than 4 hours.	

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

Product Sampling PROC2

Sample via a closed loop or other system to avoid exposure.

Avoid carrying out activities involving exposure for more than 15 minutes.

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

Laboratory activities PROC15

Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

Wear suitable gloves tested to EN374.

marine vessel/barge (un)loading PROC8b

Transfer via enclosed lines

Avoid carrying out activities involving exposure for more than 4 hours.

Clear transfer lines prior to de-coupling.

Retain drain downs in sealed storage pending disposal or for subsequent recycle.

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

Road tanker/rail car loading PROC8b

Ensure material transfers are under containment or extract ventilation.

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

Drum/batch transfers PROC8b

Ensure material transfers are under containment or extract ventilation.

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

or

Ensure operation is undertaken outdoors.

Avoid carrying out activities involving exposure for more than 1 hour.

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

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 specific activity training.

Retain drain downs in sealed storage pending disposal or for subsequent recycle.

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: 0.0025

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

Regional use tonnage (tonnes/year): 12000000 tons/yr

Environmental factors not influenced by risk management

Local freshwater dilution factor [EF1] 10

Local marine water dilution factor: [EF2] 100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (after typical onsite RMMs consistent with The Solvent Emissions Regulations requirements): [OOC11] 0.0000002

Release fraction to soil from process (initial release prior to RMM): 0.0001

Release fraction to wastewater from process (initial release prior to RMM): 0.0000034

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 % 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 =: 88.3 %</p>
<p>Organisation measures to prevent/limit release from site</p> <p>Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from wastewater. Sludge should be incinerated, contained or reclaimed.</p>
<p>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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 110000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 89 %</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 and 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 carcinogenic effects[G33] 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 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] No exposure assessment presented for human health. [G39]	
Contributing Scenarios/ Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)	
General measures (carcinogens) Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
General exposures (closed systems) PROC1 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) Product Sampling PROC2 Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 1 hour. provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems) PROC3 Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Outdoor. Bulk closed unloading PROC8b Transfer via enclosed lines Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

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Drum/batch transfers PROC8b

Ensure material transfers are under containment or extract ventilation.

or

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

Avoid carrying out activities involving exposure for more than 1 hour.

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

Operation of solids filtering equipment PROC2

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

Avoid carrying out activities involving exposure for more than 4 hours.

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

Bulk product storage PROC2

Store substance within a closed system.

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

Avoid carrying out activities involving exposure for more than 4 hours.

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

Use as a fuel (closed systems) PROC16

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

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 specific activity training.

Retain drain downs in sealed storage pending disposal or for subsequent recycle.

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: 0.2

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

Regional use tonnage (tonnes/year): 7600000 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): 0.0005

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.

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 =: >= 88.6 %

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<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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 5200000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is =: 89 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p> <p>Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1] 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>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>Not applicable</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 carcinogenic effects[G33] 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 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)	
<p>General measures (carcinogens) Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.</p> <p>General exposures (closed systems) PROC1 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>General exposures (closed systems) Product Sampling PROC2 Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 1 hour. provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p>General exposures (closed systems) PROC3 Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 1 hour. provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>Bulk closed unloading PROC8b provide a good standard of controlled ventilation (10 to 15 air changes per hour).</p>	

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<p>Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour.</p> <p>or</p> <p>Ensure material transfers are under containment or extract ventilation.</p> <p>Drum/batch transfers PROC8b provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour.</p> <p>or</p> <p>Ensure material transfers are under containment or extract ventilation.</p> <p>refuelling PROC8b Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour.</p> <p>Use as a fuel (closed systems) PROC16 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p> <p>Equipment cleaning and maintenance PROC8a provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately.</p> <p>General exposures (closed systems) PROC2 provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out activities involving exposure for more than 4 hours. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.</p>
Section 2.2 Control of environmental exposure
Product characteristics
<p>Predominantly hydrophobic. Substance is complex UVCB.</p>
Duration, frequency and amount
<p>Annual site tonnage (tonnes/year): 1300 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): 3500 kg / day Regional use tonnage (tonnes/year): 2600000 tons/yr</p>
Environmental factors not influenced by risk management
<p>Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100</p>
Other given operational conditions affecting environmental exposure
<p>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>
Technical conditions and measures at process level (source) to prevent release
<p>Common practices vary across sites thus conservative process release estimates used.</p>
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
<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</p>

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<p>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: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of $\geq 66.1\%$</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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 11000 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 89 %</p>
<p>Conditions and measures related to external treatment of waste for disposal</p>
<p>Combustion emissions considered in regional exposure assessment [ETW2] Combustion emissions limited by required exhaust emission controls [ETW1] 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>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 carcinogenic effects[G33] 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:	
Road and construction applications	
Use Descriptor	
Sector(s) of Use	SU22
Process Categories	PROC8a, PROC8b
Environmental Release Categories	
Specific Environmental Release Category	ESVOC 8.15.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading)	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristic	
Liquid	
Duration, frequency and amount	
Covers daily exposures up to 8 hours (unless stated differently)[G2]	
Covers percentage substance in the product up to 100 %[G13]	
Other given operational conditions affecting workers exposure	
Assumes a good basic standard of occupational hygiene is implemented [G1]	
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 (carcinogens) Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
Material transfers PROC8b Ensure material transfers are under containment or extract ventilation. Limit the substance content in the mixture to 1 %. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.	
Equipment cleaning and maintenance PROC8a Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Limit the substance content in the mixture to 1 %.	
Section 2.2 Control of environmental exposure	
Product characteristics	
Predominantly hydrophobic. Substance is complex UVCB.	
Duration, frequency and amount	

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Annual site tonnage (tonnes/year): 1.2 tons/yr Continuous release. Emission Days (days/year): 365 days/yr Fraction of EU tonnage used in region: 0.1 Fraction of Regional tonnage used Locally: 0.0005 Maximum daily site tonnage (kg/d): 3.3 kg / day Regional use tonnage (tonnes/year): 2400 tons/yr
Environmental factors not influenced by risk management
Local freshwater dilution factor [EF1] 10 Local marine water dilution factor: [EF2] 100
Other given operational conditions affecting environmental exposure
Release fraction to air from wide dispersive use (regional only): 0.95 Release fraction to soil from wide dispersive use (regional only): 0.04 Release fraction to wastewater from wide dispersive use: 0.01
Technical conditions and measures at process level (source) to prevent release
Common practices vary across sites thus conservative process release estimates used.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of =: >= 0 Risk from environmental exposure is driven by freshwater sediment. Treat air emissions to provide a typical removal (or abatement?) efficiency of: Not Applicable Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement) efficiency of =: >= 65.6 %
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: 89 % Not applicable as there is no release to wastewater. The maximum allowable site tonnage (MSafe) based on domestic sewage plant effluent release is: 10 kg / day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs is: 89 %
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 carcinogenic effects[G33] 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]

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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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