

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

| | |
|------------------------------|---|
| Name of the substance | Gas oils (petroleum), hydrodesulphurized light vacuum |
| Identification number | 649-437-00-4 (Index number) |
| Registration number | 01-2119485284-32-0001 |
| Synonyms | None. |
| Issue date | 23-January-2023 |
| Version number | 01 |
| Revision date | - |
| Supersedes date | - |

1.2. Relevant identified uses of the substance or mixture and uses advised against

| | |
|-----------------------------|---|
| Identified uses | Use as a fuel. A complete list of registered uses for this product can be found in the table of content of the exposure scenario for communication, available as an annex to the eSDS. |
| Uses advised against | All other uses. |

1.3. Details of the supplier of the safety data sheet

| | |
|-----------------------|--|
| Company name | Petroineos Manufacturing Scotland Ltd |
| Address | Bo'ness Road, Grangemouth Stirlingshire FK3 9XH United Kingdom |
| Telephone | +44-1324-493384 |
| e-mail | msds.Olefins@ineos.com |
| Contact person | - |

1.4. Emergency telephone number

| | |
|------------------------------|--|
| 3E Emergency Services | +44 20 35147487; 0800 680 0425 Access code: 335245: Available 24 hours a day, 7 days a week. |
|------------------------------|--|

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards

| | | |
|-------------------|------------|-------------------------------------|
| Flammable liquids | Category 3 | H226 - Flammable liquid and vapour. |
|-------------------|------------|-------------------------------------|

Health hazards

| | | |
|--|---|--|
| Acute toxicity, inhalation | Category 4 | H332 - Harmful if inhaled. |
| Skin corrosion/irritation | Category 2 | H315 - Causes skin irritation. |
| Carcinogenicity | Category 2 | H351 - Suspected of causing cancer. |
| Specific target organ toxicity - repeated exposure | Category 2 (bone marrow, liver, thymus) | H373 - May cause damage to organs (bone marrow, liver, thymus) through prolonged or repeated exposure. |
| Aspiration hazard | Category 1 | H304 - May be fatal if swallowed and enters airways. |

Environmental hazards

| | | |
|--|------------|---|
| Hazardous to the aquatic environment, long-term aquatic hazard | Category 2 | H411 - Toxic to aquatic life with long lasting effects. |
|--|------------|---|

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

| | |
|------------------|---|
| Contains: | Gas oils (petroleum), hydrodesulphurized light vacuum |
|------------------|---|

Hazard pictograms



Signal word

Danger

Hazard statements

| | |
|------|---|
| H226 | Flammable liquid and vapour. |
| H304 | May be fatal if swallowed and enters airways. |
| H315 | Causes skin irritation. |
| H332 | Harmful if inhaled. |
| H351 | Suspected of causing cancer. |
| H373 | May cause damage to organs (bone marrow, liver, thymus) through prolonged or repeated exposure. |
| H411 | Toxic to aquatic life with long lasting effects. |

Precautionary statements

Prevention

| | |
|------|--|
| P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| P260 | Do not breathe mist/vapours. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves. |

Response

| | |
|-------------|--|
| P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTRE/doctor. |
| P331 | Do NOT induce vomiting. |

Storage

Not assigned.

Disposal

Not assigned.

Supplemental information on the label

None.

2.3. Other hazards

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.
Hydrogen sulphide (H₂S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|---|-----|-------------------------|------------------------|--------------|---|
| Gas oils (petroleum), hydrodesulphurized light vacuum | 100 | 64742-87-6 265-190-1 | 01-2119485284-32-0001 | 649-437-00-4 | Classification: Flam. Liq. 3;H226, Acute Tox. 4;H332, Skin Irrit. 2;H315, Carc. 2;H351, STOT RE 2;H373, Asp. Tox. 1;H304, Aquatic Chronic 2;H411 |

Composition comments

This product is registered under the REACH Regulation 1907/2006 as a UVCB.
All concentrations are in percent by weight unless ingredient is a gas.
Hydrogen sulphide (H₂S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

SECTION 4: First aid measures

General information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. IF exposed or concerned: Get medical advice/attention. Keep the affected person warm and at rest. Wash contaminated clothing before reuse.

4.1. Description of first aid measures

Inhalation

If breathing is difficult, give oxygen. Get medical attention if discomfort develops or persists.
If there is any suspicion of inhalation of H₂S:
Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures.
Remove casualty to fresh air as quickly as possible.
Immediately begin artificial respiration if breathing has ceased.
Provision of oxygen may help.
Obtain medical advice for further treatment.

Skin contact

Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

| | |
|--|---|
| Ingestion | Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. |
| 4.2. Most important symptoms and effects, both acute and delayed | Aspiration may cause pulmonary oedema and pneumonitis. Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain. Jaundice. Prolonged exposure may cause chronic effects. |
| 4.3. Indication of any immediate medical attention and special treatment needed | Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed. |

SECTION 5: Firefighting measures

| | |
|---|---|
| General fire hazards | Flammable liquid and vapour. |
| 5.1. Extinguishing media | |
| Suitable extinguishing media | Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂). |
| Unsuitable extinguishing media | Do not use water jet as an extinguisher, as this will spread the fire. |
| 5.2. Special hazards arising from the substance or mixture | Vapours may form explosive mixtures with air. Vapours may travel considerable distance to a source of ignition and flash back. Material will float and can be re-ignited on surface of water. Thermal decomposition may produce smoke, oxides of carbon and lower molecular weight organic compounds whose composition have not been characterised. Sulfur Oxides (SO _x). Nitrogen Oxides (NO _x). |
| 5.3. Advice for firefighters | |
| Special protective equipment for firefighters | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Special fire fighting procedures | In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |

SECTION 6: Accidental release measures

| | |
|---|--|
| 6.1. Personal precautions, protective equipment and emergency procedures | |
| For non-emergency personnel | Wear appropriate personal protective equipment. Do not breathe mist/vapours. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. In case of spills, beware of slippery floors and surfaces. |
| For emergency responders | Keep unnecessary personnel away. Stay upwind. Ventilate closed spaces before entering them. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist/vapours. Use personal protection recommended in Section 8 of the SDS. |
| 6.2. Environmental precautions | Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. |
| 6.3. Methods and material for containment and cleaning up | Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil etc) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. Prevent entry into waterways, sewer, basements or confined areas. |
| | Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. |
| | Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Clean surface thoroughly to remove residual contamination. |
| | Never return spills to original containers for re-use. Put material in suitable, covered, labelled containers. The product is insoluble in water. |
| 6.4. Reference to other sections | For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS. |

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Access to work area should be restricted to people handling the product only. Should be handled in closed systems, if possible. Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability. If sulfur compounds are suspected to be present in the product, check the atmosphere for H₂S content. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapour. Avoid contact with eyes, skin, and clothing. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Be aware of potential for surfaces to become slippery. Do not eat, drink or smoke when using the product. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see section 10 of the SDS).

7.3. Specific end use(s)

For detailed information, see section 1. Observe industrial sector guidance on best practices.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no effect levels (DNELs)

General population

| Product | Value | Assessment factor | Notes |
|--|-------------------------|-------------------|---|
| Gas oils (petroleum), hydrodesulphurized light vacuum (CAS 64742-87-6) | | | |
| Long-term, Systemic, Dermal | 1.25 mg/kg | 40 | Repeated dose toxicity |
| Long-term, Systemic, Inhalation | 20.22 mg/m ³ | 12.5 | developmental toxicity / teratogenicity |
| Long-term, Systemic, Oral | 1.25 mg/kg | 40 | Repeated dose toxicity |

Workers

| Product | Value | Assessment factor | Notes |
|--|-------------------------|-------------------|---|
| Gas oils (petroleum), hydrodesulphurized light vacuum (CAS 64742-87-6) | | | |
| Long-term, Systemic, Dermal | 2.91 mg/kg | 24 | Repeated dose toxicity |
| Long-term, Systemic, Inhalation | 68.34 mg/m ³ | 7.5 | developmental toxicity / teratogenicity |

Predicted no effect concentrations (PNECs)

Not available.

8.2. Exposure controls

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

General information

Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face protection

Wear safety glasses with side shields (or goggles). Eye protection should meet standard EN 166.

Skin protection

- Hand protection

Wear suitable gloves tested to EN374. In full contact: Glove material: Nitrile rubber. Layer thickness: 0.3-0.45 mm. Breakthrough time: >480 min. Splash contact: Glove material: Neoprene; Layer thickness: 0.75 mm; Breakthrough time: 10-30 min.

- Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. In case of inadequate ventilation or risk of inhalation of oil mist, suitable respiratory equipment with combination filter (type A2/P2) can be used.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

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|--|--|
| Hygiene measures | Observe any medical surveillance requirements. When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. |
| Environmental exposure controls | Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels. |

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

| | |
|---|---|
| Physical state | Liquid. |
| Form | Liquid. |
| Colour | Property has not been measured. |
| Odour | Property has not been measured. |
| Odour threshold | Property has not been measured. |
| pH | Not applicable (insoluble in water). |
| Melting point/freezing point | > -40 - < 6 °C (> -40 - < 42.8 °F) |
| Initial boiling point and boiling range | > 141 - < 462 °C (> 285.8 - < 863.6 °F) |
| Flash point | > 56 °C (> 132.8 °F) |
| Evaporation rate | Property has not been measured. |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | |
| Explosive limit - lower (%) | Property has not been measured. |
| Explosive limit – upper (%) | Property has not been measured. |
| Vapour pressure | 0.4 kPa (40 °C (104 °F)) |
| Vapour density | Property has not been measured. |
| Relative density | > 0.8 - < 0.91 (20 °C (68 °F)) |
| Solubility(ies) | |
| Solubility (water) | Insoluble in water. |
| Partition coefficient (n-octanol/water) | > 3 Property has not been measured. |
| Auto-ignition temperature | >= 225 °C (>= 437 °F) |
| Decomposition temperature | Property has not been measured. |
| Viscosity | >= 1.5 mm ² /s (40 °C (104 °F)) |
| Explosive properties | Not explosive. |
| Oxidising properties | Not oxidising. |
| 9.2. Other information | No relevant additional information available. |

SECTION 10: Stability and reactivity

| | |
|---|--|
| 10.1. Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| 10.2. Chemical stability | Material is stable under normal conditions. |
| 10.3. Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| 10.4. Conditions to avoid | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials. |
| 10.5. Incompatible materials | Strong oxidising agents. |
| 10.6. Hazardous decomposition products | Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Sulfur oxides (SO _x). Nitrogen oxides (NO _x). |

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

| | |
|---------------------|-------------------------|
| Inhalation | Harmful if inhaled. |
| Skin contact | Causes skin irritation. |

| | |
|--------------------|---|
| Eye contact | Direct contact with eyes may cause temporary irritation. |
| Ingestion | Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. |
| Symptoms | Aspiration may cause pulmonary oedema and pneumonitis. Skin irritation. Jaundice. May cause redness and pain. Prolonged exposure may cause chronic effects. |

11.1. Information on toxicological effects

| | |
|-----------------------|---|
| Acute toxicity | May be fatal if swallowed and enters airways. Harmful if inhaled. Hydrogen sulfide, a highly toxic gas may be present. Signs and symptoms of overexposure to hydrogen sulfide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odor does not provide a reliable indicator of the presence of hazardous levels of gas in the atmosphere. |
|-----------------------|---|

| Product | Species | Test Results |
|--|---|-------------------|
| Gas oils (petroleum), hydrodesulphurized light vacuum (CAS 64742-87-6) | | |
| Acute | | |
| Dermal | | |
| LD50 | Rabbit | > 4300 mg/kg |
| Inhalation | | |
| <i>vapour/aerosol</i> | | |
| LC50 | Rat | 4.1 mg/l, 4 Hours |
| Oral | | |
| LD50 | Rat | > 5000 mg/kg |
| Skin corrosion/irritation | Causes skin irritation. | |
| Serious eye damage/eye irritation | Direct contact with eyes may cause temporary irritation. | |
| Respiratory sensitisation | Based on available data, the classification criteria are not met. | |
| Skin sensitisation | Based on available data, the classification criteria are not met. | |
| Germ cell mutagenicity | Based on available data, the classification criteria are not met. | |
| Carcinogenicity | Suspected of causing cancer. | |
| Reproductive toxicity | Based on available data, the classification criteria are not met. | |
| Specific target organ toxicity - single exposure | Based on available data, the classification criteria are not met. | |
| Specific target organ toxicity - repeated exposure | May cause damage to organs (bone marrow, liver, thymus) through prolonged or repeated exposure. | |
| Aspiration hazard | May be fatal if swallowed and enters airways. | |
| Mixture versus substance information | The product is a substance. | |
| Other information | May be absorbed through the skin. | |

SECTION 12: Ecological information

12.1. Toxicity Toxic to aquatic life with long lasting effects.

| Product | Species | Test Results |
|--|---------------------------------------|---------------------------------|
| Gas oils (petroleum), hydrodesulphurized light vacuum (CAS 64742-87-6) | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Algae | ErL50 Pseudokirchneriella subcapitata | 22 mg/l, 72 hours (Read-across) |
| Crustacea | EL50 Daphnia magna | 68 mg/l, 48 hours (Read-across) |
| Fish | LL50 Freshwater fish | 21 mg/l, 96 hours (Read-across) |
| <i>Chronic</i> | | |
| Crustacea | NOEL Daphnia magna | 0.2 mg/l, 21 days (Estimated) |
| Fish | NOEL Oncorhynchus mykiss | 0.083 mg/l, 14 days (Estimated) |

12.2. Persistence and degradability The product is readily biodegradable in water.

12.3. Bioaccumulative potential The product is not bioaccumulating.

Partition coefficient n-octanol/water (log Kow) > 3

Bioconcentration factor (BCF) Not available.

| | |
|---|---|
| 12.4. Mobility in soil | This substance has low mobility in the environment. |
| 12.5. Results of PBT and vPvB assessment | This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. |
| 12.6. Other adverse effects | Oil spills are generally hazardous to the environment. |

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|-------------------------------------|--|
| Residual waste | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |
| EU waste code | The Waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Disposal methods/information | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Special precautions | Dispose in accordance with all applicable regulations. |

SECTION 14: Transport information

ADR

| | |
|---|---|
| 14.1. UN number | UN1202 |
| 14.2. UN proper shipping name | GAS OIL |
| 14.3. Transport hazard class(es) | |
| Class | 3 |
| Subsidiary risk | - |
| Label(s) | 3 |
| Hazard No. (ADR) | 30 |
| Tunnel restriction code | D/E |
| 14.4. Packing group | III |
| 14.5. Environmental hazards | Yes |
| 14.6. Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |

RID

| | |
|---|---|
| 14.1. UN number | UN1202 |
| 14.2. UN proper shipping name | GAS OIL |
| 14.3. Transport hazard class(es) | |
| Class | 3 |
| Subsidiary risk | - |
| Label(s) | 3 |
| 14.4. Packing group | III |
| 14.5. Environmental hazards | Yes |
| 14.6. Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |

ADN

| | |
|---|---|
| 14.1. UN number | UN1202 |
| 14.2. UN proper shipping name | GAS OIL |
| 14.3. Transport hazard class(es) | |
| Class | 3 |
| Subsidiary risk | - |
| Label(s) | 3 |
| 14.4. Packing group | III |
| 14.5. Environmental hazards | Yes |
| 14.6. Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |

IATA

| | |
|--------------------------------------|---------|
| 14.1. UN number | UN1202 |
| 14.2. UN proper shipping name | Gas oil |

14.3. Transport hazard class(es)**Class** 3**Subsidiary risk** -**14.4. Packing group** III**14.5. Environmental hazards** Yes**ERG Code** 3L**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.**IMDG****14.1. UN number** UN1202**14.2. UN proper shipping name** GAS OIL**14.3. Transport hazard class(es)****Class** 3**Subsidiary risk** -**14.4. Packing group** III**14.5. Environmental hazards****Marine pollutant** Yes**EmS** F-E, S-E**14.6. Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****Retained direct EU regulations****Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended**

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended**

Not listed.

Restrictions on use**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**

Not listed.

Other EU regulations**Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended**

Not listed.

Other regulations

This product is classified and labelled in accordance with the retained CLP Regulation (EC) No 1272/2008, as amended for Great Britain. This Safety Data Sheet is compiled in accordance with REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758.

Part 1 (Classified Substances) - P5c Flammable liquids, Categories 2 or 3 not covered by P5a and P5b.

Part 1 (Classified Substances) - E2 Hazardous to the Aquatic Environment in Category Chronic 2. Directive 2012/18/EU on major accident hazards involving dangerous substances:

Part 2 (Named dangerous substances) - 34. Petroleum products and alternative fuels.

Follow specific measures on the prevention and control of exposure to carcinogens and mutagens in accordance with the Control of Substances Hazardous to Health Regulations 2002 [SI 2002/2677], as amended. Follow national regulation on the protection of workers from the risks of exposure to carcinogens and mutagens at work, in accordance with Directive 2004/37/EC. New or expectant mothers should not work with this product if there is a risk due to exposure, in accordance with the Management of Health and Safety at Work Regulations 1999 [SI 1999/3242], as amended. Follow the requirements of the Control of Substances Hazardous to Health Regulations 2002 [SI 2002/2677], as amended, when using this material.

15.2. Chemical safety assessment

Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.

ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.

IATA: International Air Transport Association.

IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

IMDG: International Maritime Dangerous Goods.

MARPOL: International Convention for the Prevention of Pollution from Ships.

PBT: Persistent, bioaccumulative and toxic.

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.

vPvB: Very persistent and very bioaccumulative.

References

Chemical safety report.

Information on evaluation method leading to the classification of mixture

Not applicable.

Full text of any statements, which are not written out in full under sections 2 to 15

H226 Flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H332 Harmful if inhaled.

H351 Suspected of causing cancer.

H373 May cause damage to organs through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

Training information

Follow training instructions when handling this material.

Disclaimer

Petroineos Manufacturing Scotland Ltd cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Annex to the extended Safety Data Sheet (eSDS)

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1 - Exposure Scenario Worker

1. Manufacture of substance

List of use descriptors

Sector(s) of Use Manufacture of substance

Name of contributing environmental scenario and corresponding ERC ERC1: Manufacture of the substance

List of names of contributing worker scenarios and corresponding PROCs PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4: Chemical production where opportunity for exposure arises
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Manufacture of the substance

Product characteristics

Physical state Liquid.
Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region 0.1
Regional use tonnage 9100 tonnes/year
Fraction of regional tonnage used locally 1
Annual site tonnage 9100 tonnes/year
Maximum daily site tonnage 91000 kg/day

Frequency and duration of use

Continuous process Emission days (days/year): 100

Environment factors not influenced by risk management

Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

| Type | Emission days (days/year) | Emission factors | | | Remarks |
|------------------------------|---------------------------|------------------|--------|---------|---------|
| | | Air | Soil | Water | |
| initial release prior to RMM | 100 | 0.01 | 0.0001 | 0.00003 | |

Risk management measures (RMM)

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

Air Treat air emission to provide a typical removal efficiency of (%): 90
Soil Not applicable.
Water Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): 52.5. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): 0
Sediment Not applicable.

Organisational measures to prevent/limit release from site Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type Municipal Sewage Treatment Plant

| | |
|---|---|
| Discharge rate | 10000 m3/day |
| Treatment effectiveness | 93.2 % |
| Sludge treatment technique | Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. |
| Remarks | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 6.3e5 kg/d |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 93.2 % |

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

| | |
|---------------------------------|--|
| Suitable waste treatment | During manufacturing no waste of the substance is generated. |
| Disposal methods | Not applicable. |
| Treatment effectiveness | Not available. |

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

| | |
|------------------------------------|--|
| Suitable recover operations | During manufacturing no waste of the substance is generated. |
|------------------------------------|--|

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

| | |
|-------------------------------------|--|
| Physical form of the product | Liquid With potential for aerosol generation |
| vapour pressure | Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure |

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

| | |
|---|--|
| Technical conditions and measures at process level (source) to prevent release | General exposures (closed systems): Handle substance within a closed system. Bulk product storage: Store substance within a closed system. |
| Technical conditions and measures to control dispersion from source towards the worker | Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified. Bulk closed loading and unloading: Handle substance within a closed system. |
| Organizational measures to prevent/limit releases, dispersion and exposure | General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance. |

Conditions and measures related to personal protection, hygiene and health evaluations

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

General exposures (open systems): Wear suitable gloves tested to EN374.

Bulk closed loading and unloading: Wear suitable gloves tested to EN374.

Bulk open loading and unloading: Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

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

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

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 wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

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

2 - Exposure Scenario Worker

1. Formulation & (re)packing of substances and mixtures

List of use descriptors

| | |
|---|---|
| Sector(s) of Use | Formulation & (re)packing of substances and mixtures |
| Name of contributing environmental scenario and corresponding ERC | ERC2: Formulation into mixture |
| List of names of contributing worker scenarios and corresponding PROCs | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC14: Tableting, compression, extrusion, pelettisation, granulation PROC15: Use as laboratory reagent |

2.1.1. Contributing scenario controlling environmental exposure for Formulation into mixture

Product characteristics

| | |
|-----------------------|---|
| Physical state | Liquid. Substance is complex UVCB. Predominantly hydrophobic |
|-----------------------|---|

Amounts used

| | |
|--|------------------|
| Fraction of EU tonnage used in region | 0.1 |
| Regional use tonnage | 9100 tonnes/year |
| Fraction of regional tonnage used locally | 1 |
| Annual site tonnage | 9100 tonnes/year |
| Maximum daily site tonnage | 30000 kg/day |

Frequency and duration of use

| | |
|---------------------------|---------------|
| Continuous process | 300 days/year |
|---------------------------|---------------|

Environment factors not influenced by risk management

| | |
|--|-----|
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |

Other given operational conditions affecting environmental exposure

| Type | Emission days (days/year) | Emission factors | | | Remarks |
|------------------------------|------------------------------|------------------|--------|---------|---------|
| | | Air | Soil | Water | |
| initial release prior to RMM | 300 | 0.01 | 0.0001 | 0.00002 | |

Risk management measures (RMM)

| | |
|---|--|
| 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

| | |
|-----------------|--|
| Air | Treat air emission to provide a typical removal efficiency of (%): 0 |
| Soil | Not applicable. |
| Water | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): 57.2. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): 0 |
| Sediment | Not applicable. |

| | |
|---|---|
| Organisational measures to prevent/limit release from site | Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. |
|---|---|

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

| | |
|--|---|
| Type | Municipal Sewage Treatment Plant |
| Discharge rate | 2000 m3/day |
| Treatment effectiveness | 93.2 % |
| Sludge treatment technique | Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. |
| Remarks | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 1.9e5 kg/d |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 93.2 % |

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

| | |
|--------------------------|---|
| Suitable waste treatment | External treatment and disposal of waste should comply with applicable local and/or national regulations. |
| Disposal methods | Not applicable. |
| Treatment effectiveness | Not available. |

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

| | |
|-----------------------------|---|
| Suitable recover operations | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
|-----------------------------|---|

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

| | |
|------------------------------|--|
| Physical form of the product | Liquid With potential for aerosol generation |
| vapour pressure | Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure |

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

| | |
|--|---|
| Technical conditions and measures at process level (source) to prevent release | General exposures (closed systems): Handle substance within a closed system. Storage: Store substance within a closed system. |
| Technical conditions and measures to control dispersion from source towards the worker | Batch processes at elevated temperatures: Provide extract ventilation to points where emissions occur. Process sampling: No other specific measures identified. Drum/batch transfers: Use drum pumps or carefully pour from container. Bulk transfers: Handle substance within a closed system. Mixing operations (open systems): Provide extract ventilation to points where emissions occur. Laboratory activities: No other specific measures identified. |

Organizational measures to prevent/limit releases, dispersion and exposure

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

Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations

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

General exposures (open systems): Wear suitable gloves tested to EN374.

Drum/batch transfers: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk transfers: Wear suitable gloves tested to EN374.

Mixing operations (open systems): Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Production of preparations or articles by tableting, compression, extrusion, pelettisation: Wear suitable gloves tested to EN374.

Drum and small package filling: Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

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

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

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 wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

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

3 - Exposure Scenario Worker

1. Distribution of substance

List of use descriptors

| | |
|--|--|
| Sector(s) of Use | Distribution of substance |
| Name of contributing environmental scenario and corresponding ERC | ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5: Use at industrial site leading to inclusion into/onto article ERC6a: Use of intermediate ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7: Use of functional fluid at industrial site |

List of names of contributing worker scenarios and corresponding PROCs

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
 PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
 PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
 PROC4: Chemical production where opportunity for exposure arises
 PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
 PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
 PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
 PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

Physical state Liquid.
 Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region 0.1
Regional use tonnage 9100 tonnes/year
Fraction of regional tonnage used locally 0.002
Annual site tonnage 18 tonnes/year
Maximum daily site tonnage 910 kg/day

Frequency and duration of use

Continuous process Emission days (days/year): 20

Environment factors not influenced by risk management

Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

| Type | Emission days (days/year) | Emission factors | | | Remarks |
|------------------------------|---------------------------|------------------|---------|----------|---------|
| | | Air | Soil | Water | |
| initial release prior to RMM | 20 | 0.0001 | 0.00001 | 0.000001 | |

Risk management measures (RMM)

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

Air Treat air emission to provide a typical removal efficiency of (%): 90
Soil Not applicable.
Water Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): 0. If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): 0

| | |
|---|---|
| Sediment | Not applicable. |
| Organisational measures to prevent/limit release from site | Risk from environmental exposure is driven by freshwater sediment. No wastewater treatment required. |
| Conditions and measures related to municipal sewage treatment plant | |
| Size of municipal sewage system/treatment plant (m3/d) | |
| Type | Municipal Sewage Treatment Plant |
| Discharge rate | 2000 m3/day |
| Treatment effectiveness | 93.2 % |
| Sludge treatment technique | Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. |
| Remarks | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 3.5e6 kg/d |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 93.2 % |

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

| | |
|---------------------------------|---|
| Suitable waste treatment | External treatment and disposal of waste should comply with applicable local and/or national regulations. |
| Disposal methods | Not applicable. |
| Treatment effectiveness | Not available. |

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

| | |
|------------------------------------|---|
| Suitable recover operations | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
|------------------------------------|---|

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

| | |
|-------------------------------------|--|
| Physical form of the product | Liquid With potential for aerosol generation |
| vapour pressure | Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure |

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

| | |
|---|--|
| Technical conditions and measures at process level (source) to prevent release | General exposures (closed systems): Handle substance within a closed system. Storage: Handle substance within a closed system. |
| Technical conditions and measures to control dispersion from source towards the worker | Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified. Bulk closed loading and unloading: Handle substance within a closed system. |

Organizational measures to prevent/limit releases, dispersion and exposure

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

Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations

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

General exposures (open systems): Wear suitable gloves tested to EN374.

Bulk closed loading and unloading: Wear suitable gloves tested to EN374.

Bulk open loading and unloading: Wear suitable gloves tested to EN374.

Drum and small package filling: Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

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

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

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 wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

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

4 - Exposure Scenario Worker

1. Use as a fuel, Industrial

List of use descriptors

| | |
|---|---|
| Sector(s) of Use | Industrial uses |
| Name of contributing environmental scenario and corresponding ERC | ERC7: Use of functional fluid at industrial site |
| List of names of contributing worker scenarios and corresponding PROCs | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC16: Use of fuels |

2.1.1. Contributing scenario controlling environmental exposure for Use of functional fluid at industrial site

Product characteristics

| | |
|-----------------------|---|
| Physical state | Liquid. Substance is complex UVCB. Predominantly hydrophobic |
|-----------------------|---|

Amounts used

| | |
|--|-----------------|
| Fraction of EU tonnage used in region | 0.1 |
| Regional use tonnage | 910 tonnes/year |
| Fraction of regional tonnage used locally | 1 |
| Annual site tonnage | 910 tonnes/year |
| Maximum daily site tonnage | 45000 kg/day |

Frequency and duration of use

| | |
|---------------------------|-------------------------------|
| Continuous process | Emission days (days/year): 20 |
|---------------------------|-------------------------------|

Environment factors not influenced by risk management

| | |
|--|-----|
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |

Other given operational conditions affecting environmental exposure

| Type | Emission days (days/year) | Emission factors | | | Remarks |
|------------------------------|---------------------------|------------------|------|---------|---------|
| | | Air | Soil | Water | |
| initial release prior to RMM | 20 | 0.005 | 0 | 0.00001 | |

Risk management measures (RMM)

| | |
|---|--|
| 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

| | |
|-----------------|--|
| Air | Treat air emission to provide a typical removal efficiency of (%): 95 |
| Soil | Not applicable. |
| Water | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): 43.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): 0 |
| Sediment | Not applicable. |

| | |
|---|--|
| Organisational measures to prevent/limit release from site | Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. |
|---|--|

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

| | |
|-----------------------|----------------------------------|
| Type | Municipal Sewage Treatment Plant |
| Discharge rate | 2000 m3/day |

| | |
|---|---|
| Treatment effectiveness | 93.2 % |
| Sludge treatment technique | Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. |
| Remarks | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 3.8e5 kg/d |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 93.2 % |

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

| | |
|---------------------------------|--|
| Suitable waste treatment | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations. |
| Disposal methods | Not applicable. |
| Treatment effectiveness | Not available. |

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

| | |
|------------------------------------|---|
| Suitable recover operations | This substance is consumed during use and no waste of the substance is generated. |
|------------------------------------|---|

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

| | |
|-------------------------------------|--|
| Physical form of the product | Liquid With potential for aerosol generation |
| vapour pressure | Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure |

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

| | |
|---|--|
| Technical conditions and measures at process level (source) to prevent release | Use as a fuel (closed systems): No other specific measures identified. Storage: Handle substance within a closed system. |
| Technical conditions and measures to control dispersion from source towards the worker | Not available. |
| Organizational measures to prevent/limit releases, dispersion and exposure | General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance. |

Conditions and measures related to personal protection, hygiene and health evaluations

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

Bulk transfers: Wear suitable gloves tested to EN374.

Drum/batch transfers: Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

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

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

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 wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

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

5 - Exposure Scenario Worker

1. Use as a fuel, Professional

List of use descriptors

| | |
|---|---|
| Sector(s) of Use | SU22: Professional uses |
| Name of contributing environmental scenario and corresponding ERC | ERC9a: Widespread use of functional fluid (indoor) ERC9b: Widespread use of functional fluid (outdoor) |
| List of names of contributing worker scenarios and corresponding PROCs | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC16: Use of fuels |

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of functional fluid (indoor)

Product characteristics

| | |
|-----------------------|---|
| Physical state | Liquid. Substance is complex UVCB. Predominantly hydrophobic |
|-----------------------|---|

Amounts used

| | |
|--|------------------|
| Fraction of EU tonnage used in region | 0.1 |
| Regional use tonnage | 8200 tonnes/year |
| Fraction of regional tonnage used locally | 0.0005 |
| Annual site tonnage | 4.1 tonnes/year |
| Maximum daily site tonnage | 11 kg/day |

Frequency and duration of use

| | |
|---------------------------|--------------------------------|
| Continuous process | Emission days (days/year): 365 |
|---------------------------|--------------------------------|

Environment factors not influenced by risk management

| | |
|--|-----|
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |

Other given operational conditions affecting environmental exposure

| Type | Emission days (days/year) | Emission factors | | | Remarks |
|------------------------------|---------------------------|------------------|---------|---------|---------|
| | | Air | Soil | Water | |
| initial release prior to RMM | 365 | 0.0001 | 0.00001 | 0.00001 | |

Risk management measures (RMM)

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

| | |
|-----------------|--|
| Air | Not applicable. |
| Soil | Not applicable. |
| Water | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): 0. If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): 0 |
| Sediment | Not applicable. |

| | |
|---|--|
| Organisational measures to prevent/limit release from site | Risk from environmental exposure is driven by freshwater sediment. No wastewater treatment required. |
|---|--|

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

| | |
|-----------------------|----------------------------------|
| Type | Municipal Sewage Treatment Plant |
| Discharge rate | 2000 m3/day |

| | |
|---|---|
| Treatment effectiveness | 93.2 % |
| Sludge treatment technique | Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. |
| Remarks | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 2.2e5 kg/d |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 93.2 % |

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

| | |
|---------------------------------|--|
| Suitable waste treatment | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations. |
| Disposal methods | Not applicable. |
| Treatment effectiveness | Not available. |

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

| | |
|------------------------------------|---|
| Suitable recover operations | This substance is consumed during use and no waste of the substance is generated. |
|------------------------------------|---|

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

| | |
|-------------------------------------|--|
| Physical form of the product | Liquid With potential for aerosol generation |
| vapour pressure | Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure |

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

| | |
|---|---|
| Technical conditions and measures at process level (source) to prevent release | Use as a fuel (closed systems): Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. |
| | Storage: Store substance within a closed system. |
| Technical conditions and measures to control dispersion from source towards the worker | Drum/batch transfers: Use drum pumps or carefully pour from container. |
| Organizational measures to prevent/limit releases, dispersion and exposure | General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. |
| | Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance. |

Conditions and measures related to personal protection, hygiene and health evaluations

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

Bulk transfers: Wear suitable gloves tested to EN374.

Drum/batch transfers: Wear suitable gloves tested to EN374.

Refuelling: Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

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

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

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 wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

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