

SAFETY DATA SHEET**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

| | |
|--------------------------------------|--|
| Product name | Fuel Oil, residual |
| Other means of identification | <p>Fuel Oil (FO), Heavy Fuel Oil (HFO), Marine Bunker Fuel, High Sulphur Fuel Oil (HSFO), Low Sulphur Fuel Oil (LSFO), Vacuum Residue (VACRES), Intermediate Fuel Oil (IFO), Intermediate Fuel Oil 180 (IFO 180), Intermediate Fuel Oil 380 (IFO 380)</p> <p>RMA 10, RMA 10LS, RMA 10XX, RMA 10LSXX RMA 30, RMA 30LS, RMA 30XX, RMA 30LSXX RMB 30, RMB 30LS, RMB 30XX, RMB 30LSXX RMD 80, RMD 80LS, RMD 80XX, RMD 80LSXX RME 180, RME 180LS, RME 180XX, RME 180LSXX RMF 180, RMF 180LS, RMF 180XX, RMF 180LSXX RMG 180, RMG 180LS, RMG 180XX, RMG 180LSXX RMG 380, RMG 380LS, RMG 380XX, RMG 380LSXX RMG 500, RMG 500XX RMG 700, RMG 700XX RMH 380, RMH 380LS, RMH 380XX, RMH 380LSXX RMH 700, RMH 700XX RMK 380, RMK 380LS, RMK 380XX, RMK 380LSXX RMK 500, RMK 500XX RMK 700, RMK 700XX RMK 850</p> |
| Proper shipping name | MARPOL Annex 1 rules apply for bulk shipments by sea. |
| SDS no. | STI2299 |
| EC number | 270-675-6 |
| CAS number | 68476-33-5 |
| REACH Registration number | 01-2119474894-22-0060 01-2119474894-22 |
| Product type | Liquid. |

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

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

1.3 Details of the supplier of the safety data sheet

| | |
|-----------------------|--|
| Supplier | BP Europa S.E. – BP Nederland Rivium Boulevard 301 2909 LK Capelle a/d IJssel Rotterdam NETHERLANDS Tel: 010 249 1000 |
| E-mail address | MSDSadvice@bp.com |

1.4 Emergency telephone number

| | |
|-----------------------------------|---------------------------|
| EMERGENCY TELEPHONE NUMBER | +31 10 249 1000 (24 hour) |
|-----------------------------------|---------------------------|

| | | |
|--|---------------------------------------|--|
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| | | Language ENGLISH |

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition UVCB

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Acute Tox. 4, H332

Carc. 1B, H350

Repr. 2, H361d

STOT RE 2, H373

Aquatic Chronic 1, H410

Classification according to Directive 67/548/EEC [DSD]

Carc. Cat. 2; R45

Repr. Cat. 3; R63

Xn; R20, R48/21

R66

N; R50/53

See Section 16 for the full text of the R phrases or H statements declared above.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

Hazard pictograms



Signal word

Danger

Hazard statements

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.

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

Precautionary statements

Prevention

P201 - Obtain special instructions before use.

P260 - Do not breathe dust/fume/gas/mist/vapours/spray.

P281 - Use personal protective equipment as required.

P273 - Avoid release to the environment.

Response

P308 - IF exposed or concerned:

P313 - Get medical advice/attention.

Storage

- Not applicable

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Repeated exposure may cause skin dryness or cracking.

Special packaging requirements

Containers to be fitted with child-resistant fastenings

Not applicable.

Tactile warning of danger

Not applicable.

2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

No

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

No

SECTION 2: Hazards identification

Other hazards which do not result in classification

Prolonged or repeated contact may dry skin and cause irritation.
 This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas. Will cause burns if hot material contacts eyes.
 Will cause burns if hot material contacts skin.
 This material may contain significant quantities of polycyclic aromatic hydrocarbons (PCAs), some of which have been shown by experimental studies to induce skin cancer.
 Note: High Pressure Applications
 Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
 See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

SECTION 3: Composition/information on ingredients

Substance/mixture UVCB
 Heavy fuel oil Complex hydrocarbon substance

Classification

| Product/ingredient name | Identifiers | % | 67/548/EEC | Regulation (EC) No. 1272/2008 [CLP] | Type |
|-------------------------|--|-----|---|--|------|
| Fuel oil, residual | REACH #: 01-2119474894-22 EC: 270-675-6 CAS: 68476-33-5 | 100 | Carc. Cat. 2; R45 Repr. Cat. 3; R63 Xn; R20, R48/21 R66 N; R50/53 | Acute Tox. 4, H332 Carc. 1B, H350 Repr. 2, H361d STOT RE 2, H373 Aquatic Chronic 1, H410 | [*] |

See Section 16 for the full text of the R-phrases declared above.

See Section 16 for the full text of the H statements declared above.

Type

- [*] Substance
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact

Hot product - Flood with water to dissipate heat. In the event of any product remaining, do not try to remove it other than by continued irrigation with water. Obtain medical attention immediately.

Cold product - Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops or persists.

Skin contact

Hot Product - Flood skin with cold water to dissipate heat, cover with clean cotton or gauze, obtain medical advice immediately.

Cold Product - Wash contaminated skin with soap and water. Remove contaminated clothing and wash underlying skin as soon as reasonably practicable.

Never use gasoline, kerosene or other solvents to remove product from skin or clothing.

Inhalation

If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention immediately.

EXPOSURE TO HYDROGEN SULPHIDE:

Casualties suffering ill effects as a result of exposure to hydrogen sulphide should be immediately removed to fresh air and medical assistance obtained without delay. Unconscious casualties must be placed in the recovery position. Monitor breathing and pulse rate and if breathing has failed, or is deemed inadequate, respiration must be assisted, preferably by the mouth to mouth method. Administer external cardiac massage if necessary. Seek medical attention immediately.

Ingestion

Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Get medical attention immediately.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

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SECTION 4: First aid measures

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects. Inhalation of hydrogen sulphide may cause central respiratory depression leading to coma and death. It is irritant to the respiratory tract causing chemical pneumonitis and pulmonary oedema. The onset of pulmonary oedema may be delayed for 24 to 48 hours. Treat with oxygen and ventilate as appropriate. Administer broncho-dilators if indicated and consider administration of corticosteroids. Keep casualty under surveillance for 48 hours in case pulmonary oedema develops.

Note: High Pressure Applications

Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray. This substance will float and can be reignited on surface water.

Unsuitable extinguishing media

Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

In a fire or if heated, a pressure increase will occur and the container may burst. Vapours can form explosive mixtures with air. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. Avoid spraying directly into storage containers because of the danger of boil-over. Boil-over is the rapid increase in volume caused by the presence of water in hot product and the subsequent overflow from a tank.

Hazardous combustion products

Combustion products may include the following:
sulphur oxides (SO, SO₂, etc.)
carbon oxides (CO, CO₂) (carbon monoxide, carbon dioxide)
Hydrogen Sulphide (H₂S)
unidentified organic and inorganic compounds

5.3 Advice for firefighters

Special precautions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows. No action shall be taken involving any personal risk or without suitable training. Use water spray to keep fire-exposed containers cool. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment.

This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained positive pressure breathing apparatus (SCBA).

SECTION 6: Accidental release measures

For emergency responders

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately.

Spillages in water or at sea:

Product less dense than water: In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal. Product which is denser than water will sink to the bottom, and usually no intervention will be feasible. If possible, collect the product and contaminated materials with mechanical means, and store/dispose of according to relevant regulations. In special situations (to be assessed on case-by-case basis, according to expert judgement and local conditions), excavations of trenches on the bottom to collect the product with sand may be a feasible option.

6.3 Methods and materials for containment and cleaning up

Small spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spill product. Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 5 for firefighting measures.
See Section 8 for information on appropriate personal protective equipment.
See Section 12 for environmental precautions.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures

Contact with hot product may cause burns. Put on appropriate personal protective equipment. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid contact of spilt material and runoff with soil and surface waterways. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Empty containers retain product residue and can be hazardous.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Regular periodic self inspection of the skin is recommended, especially those areas subject to contamination. In the event of any localised changes in appearance or texture of the skin being noticed, medical advice should be sought without delay.

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store and use only in equipment/containers designed for use with this product. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas. Vapours containing hydrogen sulphide may accumulate during storage or transport and may also be vented during filling of tanks. Hydrogen sulphide has a typical "bad egg" smell but at high concentrations the sense of smell is rapidly lost, therefore do not rely on sense of smell for detecting hydrogen sulphide. Use specially designed measuring instruments for determining its concentration.

Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks. Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapour mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurised fuel pipes, the vapour or mists generated will create a flammability or explosion hazard. Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

PGS Storage:

Storage according to PGS 15 or 16

7.3 Specific end use(s)

Recommendations

See section 1.2 and Exposure scenarios in annex, if applicable.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

For information and guidance, the ACGIH values are included. For further information on these please consult your supplier. Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapour or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived No Effect Level

| Product/ingredient name | Type | Exposure | Value | Population | Effects |
|-------------------------|------|----------------------------------|------------------------|------------|----------|
| Fuel oil, residual | DNEL | Short term Inhalation 15 minutes | 4700 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Dermal 8 hours TWA | 0.065 mg/kg | Workers | Systemic |
| | DNEL | Long term Inhalation 8 hours TWA | 0.12 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Oral 24 hours TWA | 0.015 mg/kg bw/day | Consumers | Systemic |

Predicted No Effect Concentration

No PNECs available

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SECTION 8: Exposure controls/personal protection

8.2 Exposure controls

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
 All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
 Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards. The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

If local exhaust ventilation or other methods of ventilation are not possible or are insufficient, wear suitable respiratory protective devices. Wear suitable respiratory protective devices if there is a risk of exposure limits being exceeded. The choice of suitable respiratory device will depend upon a risk assessment of the workplace environment and the task being carried out. If required, the respiratory device must be certified as safe in defined explosive atmospheres (EX Label). Respiratory protective devices must be checked to ensure they fit correctly each time they are worn. Please consult European standard EN 529 for further guidance on the selection, use, care and maintenance of respiratory protective devices.

Suitable breathing apparatus (independent of ambient atmosphere) must be worn if any of the following situations apply.

- When the workplace atmosphere is considered to be immediately dangerous to life and health.
- When there is a risk of the workplace atmosphere being oxygen deficient.
- When the workplace atmosphere is uncontrolled.
- When the workplace atmosphere is unknown.
- When there is a risk of loss of consciousness or asphyxiation
- When entry into a confined space is required.
- When there is a risk of gases being released that could be a fire or explosion hazard.
- When the concentration of contaminants in the atmosphere exceeds the level of protection (maximum allowed concentration) given by a filtering device
- When the contaminants have a low odour that would not be tasted or smelt by the wearer of a filtering device if the filter became exhausted or saturated.
- When there is a risk of hydrogen sulphide exposure limits being exceeded.

If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.

The filter class must be suitable for the maximum contaminant concentration (gas/vapour/ aerosol/particulates) that may arise when handling the product.

Recommended: Combined filter suitable for gases, vapours and particles (dust, smoke, mist, aerosol). Filter type: AP.

Eye/face protection

Recommended: Chemical splash goggles.

Skin protection

Hand protection

Hot material: to prevent thermal burns wear heat resistant and impervious gauntlets/gloves.
 Cold material: Wear chemical resistant gloves. Recommended: nitrile gloves. Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture). Do not re-use gloves. Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis. The frequency of replacement will depend upon the circumstances of use.

Skin and body

Cold material:
 Wear suitable protective clothing.
 Footwear highly resistant to chemicals.
 When there is a risk of ignition wear inherently fire resistant protective clothes and gloves. Refer to standard: ISO 11612
 When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and gloves should all be anti-static.
 Refer to standard: EN 1149
 Cotton or polyester/cotton overalls will only provide protection against light superficial

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SECTION 8: Exposure controls/personal protection

contamination.

When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.

Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Thermal hazards

Hot material: Wear suitable protective clothing to protect against heat and brief contact with flame. Protection should be provided for exposed areas of the neck and head.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will 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. |
| Colour | Dark Brown. / Black. |
| Odour | Oily. |
| Odour threshold | Not available. |
| pH | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Melting point/freezing point | <30°C (<86°F) |
| Initial boiling point and boiling range | 150 to 750°C (302 to 1382°F) |
| Pour point | -15 to 36 °C |
| Flash point | ☑ Closed cup: >60°C (>140°F) [Pensky-Martens.] |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Upper/lower flammability or explosive limits | Lower: 0.5% Upper: 5% |
| Vapour pressure | <0.133 kPa (<1 mm Hg) at 20°C |
| Vapour density | >0.9 [Air = 1] |
| Relative density | Not available. |
| Density | 935 to 1020 kg/m ³ (0.935 to 1.02 g/cm ³) at 15°C |
| Solubility(ies) | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Partition coefficient: n-octanol/water | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Auto-ignition temperature | 250 to 537°C (482 to 998.6°F) |
| Decomposition temperature | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Viscosity | Kinematic: 180 to 2000 mm ² /s (180 to 2000 cSt) at 40°C Kinematic: >10 mm ² /s (>10 cSt) at 50°C |
| Explosive properties | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |
| Oxidising properties | Not applicable. Endpoint waived according to REACH Annex VII, IX or XI |

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

| | |
|--|---|
| 10.1 Reactivity | No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information. |
| 10.2 Chemical stability | The product is stable. |
| 10.3 Possibility of hazardous reactions | Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur. |
| 10.4 Conditions to avoid | Avoid all possible sources of ignition (spark or flame). Avoid excessive heat. |

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SECTION 10: Stability and reactivity

10.5 Incompatible materials Reactive or incompatible with the following materials: oxidising materials.

10.6 Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

| Product/ingredient name | Result / Route | Test authority / Number | Species | Dose | Exposure | Remarks | |
|-------------------------|---------------------------------------|-------------------------|--------------------|--------|------------------------|---------|---|
| Fuel oil, residual | LC50 Inhalation Dusts and mists | EPA | OTS 798. 115 | Rat | 4500 mg/m ³ | 4 hours | Based on Carbon black oil |
| | LC50 Inhalation Dusts and mists | EPA | OTS 798. 115 | Rat | 4100 mg/m ³ | 4 hours | Based on Carbon black oil |
| | LD50 Dermal | EU | B.3 | Rabbit | >2000 mg/kg | - | Based on Catalytic cracked clarified oil (CCCO) |
| | LD50 Dermal | OECD | 434 | Rabbit | >2000 mg/kg | - | Based on Heavy fuel oil |
| Fuel oil, residual | LD50 Oral | OECD | 401 | Rat | 5270 mg/kg | - | Based on Catalytic cracked clarified oil (CCCO) |
| | LD50 Oral | OECD | 401 | Rat | 4320 mg/kg | - | Based on Catalytic cracked clarified oil (CCCO) |

Irritation/Corrosion

| Product/ingredient name | Test authority / Test number | Species | Route / Result | Test concentration | Remarks | |
|-------------------------|------------------------------|---------|----------------|------------------------------------|---------|-------------------------|
| Fuel oil, residual | EU | B.4 | Rabbit | Skin - Non-irritant to skin. | - | Based on Heavy fuel oil |
| | EU | B.5 | Rabbit | Eyes - Non-irritating to the eyes. | - | Based on Heavy fuel oil |

Sensitiser

| Product/ingredient name | Route | Test authority / Test number | Species | Result | Remarks | |
|-------------------------|-------|------------------------------|---------|------------|-----------------|-------------------------|
| Fuel oil, residual | skin | EU | B.6 | Guinea pig | Not sensitising | Based on Heavy fuel oil |

GERM CELL MUTAGENICITY

| Product/ingredient name | Test authority / Test number | Cell | Type | Result | Remarks | |
|-------------------------|------------------------------|------------|----------------------|---------------------------------------|----------|---|
| Fuel oil, residual | Equivalent to OECD 476 | - | Experiment: In vitro | Subject: Mammal - species unspecified | Positive | Based on Catalytic cracked clarified oil (CCCO) |
| | Equivalent to OECD 471 | - | Experiment: In vitro | Subject: Non-mammalian species | Positive | Based on Catalytic cracked clarified oil (CCCO) |
| | Equivalent to OECD 475 | Cell: Germ | Experiment: In vivo | Subject: Unspecified | Negative | Based on Catalytic cracked clarified oil (CCCO) |
| | Equivalent to | Cell: Germ | Experiment: | Subject: | Negative | Based on Catalytic |

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Format Netherlands (Netherlands)

Language ENGLISH

SECTION 11: Toxicological information

| | | | |
|----------|---------|-------------|------------------------------|
| OECD 474 | In vivo | Unspecified | cracked clarified oil (CCCO) |
|----------|---------|-------------|------------------------------|

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity

| Product/ingredient name | Test authority / Test number | Species | Route | Exposure | Result | Remarks |
|-------------------------|------------------------------|---------|--------|----------|----------|---|
| Fuel oil, residual | Equivalent to OECD 451 | Mouse | Dermal | Lifetime | Positive | Based on Catalytic cracked clarified oil (CCCO) |

Conclusion/Summary May cause cancer

Reproductive toxicity

| Product/ingredient name | Test authority / Test number | Species | Route | Exposure | Developmental | Maternal toxicity | Fertility | Remarks |
|-------------------------|------------------------------|---------|--------|----------|---------------|-------------------|-----------|---|
| Fuel oil, residual | EPA OTS 798.4700 | Rat | Dermal | 70 days | - | - | Negative | no effects observed (Based on Catalytic cracked clarified oil (CCCO)) |
| | EPA OTS 798.4900 | Rat | Dermal | 20 days | Positive | - | - | Effects observed (Based on atmospheric residue) |

Conclusion/Summary Development: Suspected of damaging the unborn child.
 Fertility: Based on available data, the classification criteria are not met.
 Effects on or via lactation: Based on available data, the classification criteria are not met.

Aspiration hazard

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity

| Product / Ingredient Name | Hazard | Test authority / Test number | Species | Route | Type | Dose | Exposure | Target organs | Remarks | |
|---------------------------|-----------|------------------------------|----------------|--------|------------|-------|-----------------|---------------|-------------|---|
| Fuel oil, residual | STOT - RE | Equivalent to EPA | OPPTS 870.3250 | Rat | Dermal | LOAEL | 20 to 200 mg/kg | 90 days | liver blood | Based on Catalytic cracked clarified oil (CCCO) |
| | STOT - SE | Equivalent to OECD | 401 | Rat | Oral | LOAEL | >2000 mg/kg | - | - | Based on Catalytic cracked clarified oil (CCCO) |
| | STOT - SE | EPA | OTS 798.1150 | Rat | Inhalation | LOAEL | 10 to 20 mg/l | 4 hours | - | Based on Catalytic cracked clarified oil (CCCO) |
| | STOT - SE | OECD | 434 | Rabbit | Dermal | LOAEL | >2000 mg/kg | - | - | Based on Catalytic cracked clarified oil (CCCO) |

Conclusion/Summary STOT - SE: Not classified. Based on available data, the classification criteria are not met. Assessment was by using a weight of evidence approach.
 STOT - RE: May cause damage to organs through prolonged or repeated exposure. Liver, blood
 Routes of entry anticipated: Dermal, Inhalation.

Information on the likely routes of exposure

Potential acute health effects

Inhalation Harmful if inhaled.

SECTION 11: Toxicological information

Ingestion No known significant effects or critical hazards.

Skin contact Will cause burns if hot material contacts skin.

Eye contact Will cause burns if hot material contacts eyes.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Ingestion No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Eye contact No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Inhalation Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Ingestion If swallowed, may irritate the mouth, throat and digestive system. If swallowed, may cause abdominal pain, stomach cramps, nausea, vomiting, diarrhoea, dizziness and drowsiness.

Skin contact As with all such products containing potentially harmful levels of PCAs, prolonged or repeated skin contact may eventually result in dermatitis or more serious irreversible skin disorders including cancer.

Eye contact Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Potential chronic health effects

General May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer.

Carcinogenicity May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity No known significant effects or critical hazards.

Developmental effects Suspected of damaging the unborn child.

Fertility effects No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

| Product/ingredient name | Test authority / Test number | Species | Type / Result | Exposure | Effects | Remarks |
|-------------------------|------------------------------|---------|---|----------|--------------|----------------------------|
| Fuel oil, residual | OECD 202 | Daphnia | Acute EL50 2 mg/l Nominal Fresh water | 48 hours | Mobility | Based on Heavy fuel oil |
| | OECD 203 | Fish | Acute LL50 79 mg/l Nominal Fresh water | 96 hours | - | Based on residual fuel oil |
| | Modelled data | Daphnia | Chronic NOEL 0.27 mg/l Nominal Fresh water | 21 days | Reproduction | - |
| | Modelled data | Fish | Chronic NOEL 0.1 mg/l Nominal Fresh water | 28 days | Mortality | - |

Conclusion/Summary Persistent per IMO criteria

Environmental hazards Very toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

IOPC Persistent / not persistent. oil: Persistent

12.3 Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

SECTION 12: Ecological information

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination. This material may accumulate in sediments.

12.5 Results of PBT and vPvB assessment

PBT No

vPvB No

12.6 Other adverse effects

Other ecological information This product has a density close to that of water. Spills are unlikely to form a distinct film on the water surface, and may become dispersed as globules if mixed or agitated. If released to water the product may sink.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/licensed waste disposal contractor in accordance with local regulations.

Hazardous waste Yes.

European waste catalogue (EWC)

| Waste code | Waste designation |
|------------|---------------------|
| 13 07 01* | fuel oil and diesel |

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/licensed waste disposal contractor in accordance with local regulations.

Special precautions

This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Other information

Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never weld, solder or braze containers unless they are cleaned and do not contain flammable vapours and residues.

At sea, used or unwanted product should be stored for eventual discharge into port approved waste oil disposal facilities.

Dusts generated during the removal of ash deposits from engine/boiler combustion surfaces or exhaust spaces, will be harmful if inhaled and may cause nausea and eye, nose and throat irritation. Repeated contact may result in serious irreversible disorders.

Before working in combustion/exhaust spaces or handling fuel oil ash/dust the area should be thoroughly damped down with water. If this is not possible, wear full breathing apparatus or positive pressure filter sets. Protective clothing must always be worn. When inspecting combustion/exhaust spaces, wear full face dust respirator and protective clothing.

SECTION 14: Transport information

| | ADR/RID | ADN | IMDG | IATA |
|-------------------------------------|--|--|--|--|
| 14.1 UN number | UN 3082 | UN 3082 | UN 3082 | UN 3082 |
| 14.2 UN proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil) | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil) | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil). Marine pollutant | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil) |

Product name Fuel Oil, residual








Product code ST12299

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| SECTION 14: Transport information | | | | |
|--|--|--|---|--|
| 14.3 Transport hazard class(es) | 9   | 9   | 9   | 9  |
| 14.4 Packing group | III | III | III | III |
| 14.5 Environmental hazards | Yes. | Yes. | Yes. | No. |
| Additional information | Hazard identification number 90 Tunnel code E | Remarks Table: C. Danger: 9+ (N1, CMR, F or S). | Emergency schedules (EmS) F-A, S-F | - |

14.6 Special precautions for user Not available.

ADR/RID Classification code: M6

ADN Classification code: M6

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code **Proper shipping name** MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles For non-fuel uses - "Restricted to Professional Users. Attention - avoid exposure - obtain special instructions before use". Must be marked on packaging.

Other regulations

REACH Status The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

United States inventory (TSCA 8b) All components are listed or exempted.

Australia inventory (AICS) All components are listed or exempted.

Canada inventory All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (ENCS) All components are listed or exempted.

Korea inventory (KECI) Not determined.

Philippines inventory (PICCS) Not determined.

National regulations

15.2 Chemical Safety Assessment Complete.

SECTION 16: Other information

| | |
|-----------------------------------|--|
| Abbreviations and acronyms | ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS = Chemical Abstracts Service CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] CSA = Chemical Safety Assessment CSR = Chemical Safety Report DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level DPD = Dangerous Preparations Directive [1999/45/EC] DSD = Dangerous Substances Directive [67/548/EEC] EINECS = European Inventory of Existing Commercial chemical Substances ES = Exposure Scenario EUH statement = CLP-specific Hazard statement EWC = European Waste Catalogue GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) OECD = Organisation for Economic Co-operation and Development PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail RRN = REACH Registration Number SADT = Self-Accelerating Decomposition Temperature SVHC = Substances of Very High Concern STOT-RE = Specific Target Organ Toxicity - Repeated Exposure STOT-SE = Specific Target Organ Toxicity - Single Exposure TWA = Time weighted average UN = United Nations UVCB = Complex hydrocarbon substance VOC = Volatile Organic Compound vPvB = Very Persistent and Very Bioaccumulative |
|-----------------------------------|--|

Full text of abbreviated H statements

| | |
|-------|--|
| 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. |
| H410 | Very toxic to aquatic life with long lasting effects. |

Full text of classifications [CLP/GHS]

| | |
|-------------------------|---|
| Acute Tox. 4, H332 | ACUTE TOXICITY: INHALATION - Category 4 |
| Aquatic Chronic 1, H410 | AQUATIC TOXICITY (CHRONIC) - Category 1 |
| Carc. 1B, H350 | CARCINOGENICITY - Category 1B |
| Repr. 2, H361d | TOXIC TO REPRODUCTION [Unborn child] - Category 2 |
| STOT RE 2, H373 | SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 |

Full text of abbreviated R phrases

| | |
|---------|--|
| R45- | May cause cancer. |
| R63- | Possible risk of harm to the unborn child. |
| R20- | Also harmful by inhalation. |
| R48/21- | Also harmful: danger of serious damage to health by prolonged exposure in contact with skin. |
| R66- | Repeated exposure may cause skin dryness or cracking. |
| R50/53- | Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |


Full text of classifications [DSD/DPD]

| |
|---|
| Carc. Cat. 2 - Carcinogen category 2 |
| Repr. Cat. 3 - Toxic to reproduction category 3 |
| Xn - Harmful |
| N - Dangerous for the environment |

History

| | |
|--|---------------------|
| Date of issue/ Date of revision | 27/02/2013. |
| Date of previous issue | 05/02/2013. |
| Prepared by | Product Stewardship |

 Indicates information that has changed from previously issued version.

| | | |
|--|--|--|
| Product name Fuel Oil, residual | Product code  T12299 | Page: 14/42 |
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| | | Language ENGLISH |

SECTION 16: Other information

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Distribution of Substance - Industrial |
| List of use descriptors | Identified use name: Distribution of substance Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU03 Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC03, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07 Specific Environmental Release Category: ESVOC SpERC 1.1.v1 |

| | |
|---|--|
| Processes and activities covered by the exposure scenario | Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state: Liquid, vapour pressure < 0.5 kPa at STP.

Concentration of substance in product: Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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.

Process sampling Outdoor.: Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

General exposures (closed systems): Handle substance within a closed system. Avoid carrying out operation for more than 4 hours. Sample via a closed loop or other system to avoid exposure. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage: Store substance within a closed system. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Product sampling: Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

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

marine vessel/barge (un)loading: Avoid carrying out operation 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

road tanker/rail car loading: Ensure material transfers are under containment or extract ventilation. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Equipment cleaning and maintenance: Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-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: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.1e7 |
| Fraction of Regional tonnage used locally: | 2.0e-3 |
| Annual site tonnage (tonnes/year): | 2.3e4 |
| Maximum daily site tonnage (kg/day): | 7.7e4 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 300 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 1.0e-4 |
| Release fraction to soil from process (initial release prior to RMM): | 0.00001 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0e-7 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. |
| Treat air emission to provide a typical removal efficiency of (%): | 90 |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 0 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d): | 3.8e5 |
| Assumed on-site sewage treatment plant flow (m^3/d): | 2000 |
| 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. |

| | |
|---|---|
| Conditions and measures related to external recovery of waste: | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
| RCR - Air Compartment Driven: | 2.92E-02 |
| RCR - Water Compartment Driven: | 1.71E-01 |

Section 3:: Exposure estimation

| | |
|--|--|
| Exposure estimation and reference to its source - Environment | |
| Exposure assessment (environment): | The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

| | |
|--|---|
| Exposure estimation and reference to its source - Workers | |
| Exposure assessment (human): | The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. |

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| 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. |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Formulation and (Re)packing of Substance - Industrial |
| List of use descriptors | Identified use name: Formulation and (re)packing of substances and mixtures Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU03, SU10 Subsequent service life relevant for that use: No. Environmental Release Category: ERC02 Specific Environmental Release Category: ESVOC SpERC 2.2.v1 |

| | |
|---|--|
| Processes and activities covered by the exposure scenario | Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state: Liquid, vapour pressure < 0.5 kPa at STP.

Concentration of substance in product: Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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) Process sampling: 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

General exposures (closed systems): Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage: Store substance within a closed system. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Product sampling: Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic'

Fuel Oil, residual

Heavy Fuel Oil Formulation and (Re)packing of Substance - Industrial

employee training.

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

marine vessel/barge (un)loading: Transfer via enclosed lines. Avoid carrying out operation 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

road tanker/rail car loading: Ensure material transfers are under containment or extract ventilation. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

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

Equipment cleaning and maintenance: Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-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: Substance is complex UVCB Predominantly hydrophobic

Amounts used:

| | |
|---|--------|
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.1e7 |
| Fraction of Regional tonnage used locally: | 2.6e-3 |
| Annual site tonnage (tonnes/year): | 3.0e4 |
| Maximum daily site tonnage (kg/day): | 1.0e5 |

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

| | |
|--|--------|
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 2.2e-3 |
| Release fraction to soil from process (initial release prior to RMM): | 0.0001 |
| Release fraction to wastewater from process (initial release prior to RMM): | 5.0e-6 |

Technical conditions and measures at process level (source) to prevent release: Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%): 0

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): 54.0

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): 0

Organisational 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:

Estimated substance removal from wastewater via on-site sewage treatment (%): 88.8

Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): 88.8

| | |
|--|---|
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 1.1e5 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |
| 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. |
| Conditions and measures related to external recovery of waste: | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
| RCR - Air Compartment Driven: | 7.19E-01 |
| RCR - Water Compartment Driven: | 2.43E-01 |

Section 3:: Exposure estimation

| | |
|--|--|
| Exposure estimation and reference to its source - Environment | |
| Exposure assessment (environment): | The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

| | |
|--|---|
| Exposure estimation and reference to its source - Workers | |
| Exposure assessment (human): | The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. |

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| 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. |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|---|
| Short title of the exposure scenario | Heavy Fuel Oil Manufacture of Substance - Industrial |
| List of use descriptors | Identified use name: Manufacture of substance Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU03, SU08, SU09 Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04 Specific Environmental Release Category: ESVOC SpERC 1.1.v1 |

| | |
|---|--|
| Processes and activities covered by the exposure scenario | Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. 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). |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

| | |
|--|--|
| Physical state: | Liquid, vapour pressure < 0.5 kPa at STP. |
| Concentration of substance in product: | Covers percentage substance in the product up to 100% (unless stated differently). |
| Amounts used: | Not applicable. |
| Frequency and duration of use: | Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management: | Not applicable. |
| Other given operational conditions affecting workers exposure: | Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented. |

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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): Handle substance within a closed system. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Process sampling Outdoor.: Sample via a closed loop or other system to avoid exposure. Avoid carrying out activities involving exposure for more than 15 minutes. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage: Store substance within a closed system. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

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

marine vessel/barge (un)loading: Avoid carrying out operation 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

road tanker/rail car loading: Ensure material transfers are under containment or extract ventilation. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Equipment cleaning and maintenance: Wear chemical-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: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.1e7 |
| Fraction of Regional tonnage used locally: | 5.2e-2 |
| Annual site tonnage (tonnes/year): | 6.0e5 |
| Maximum daily site tonnage (kg/day): | 2.0e6 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 300 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 1.0e-4 |
| Release fraction to soil from process (initial release prior to RMM): | 0.0001 |
| Release fraction to wastewater from process (initial release prior to RMM): | 3.0e-6 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). On-site wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater. |
| Treat air emission to provide a typical removal efficiency of (%): | 90 |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 85.9 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0.0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d): | 2.3e6 |
| Assumed on-site sewage treatment plant flow (m³/d): | 10000 |
| Conditions and measures related to external treatment of waste for disposal: | During manufacturing, no waste of the substance is generated. |
| Conditions and measures related to external recovery of waste: | During manufacturing, no waste of the substance is generated. |

RCR - Air Compartment Driven: 6.69E-02

RCR - Water Compartment Driven: 9.09E-01

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment): The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers

Exposure assessment (human): The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

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. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet. If scaling reveals a condition of unsafe use (i. e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Consequently a Tier 2 assessment was performed in an attempt to refine conservative exposure assumptions and improve risk estimates. The Tier 2 analysis demonstrates that no refineries have RCRs>1 (see Appendix 4 and PETRORISK file in IUCLID section 13 - "Tier 2 Site Specific Production worksheet")

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 carcinogenic 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.



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Use of Substance as a Fuel - Industrial |
| List of use descriptors | Identified use name: Use as a fuel - Industrial Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16 Sector of end use: SU03 Subsequent service life relevant for that use: No. Environmental Release Category: ERC07 Specific Environmental Release Category: ESVOC SpERC 7.12a.v1 |

| | |
|---|---|
| Processes and activities covered by the exposure scenario | Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state: Liquid, vapour pressure < 0.5 kPa at STP.

Concentration of substance in product: Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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): Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

General exposures (closed systems) Product sampling: 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

bulk closed unloading Outdoor.: Transfer via enclosed lines. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Drum/batch transfers: 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 chemical-resistant gloves (tested to EN374) in combination with 'basic'

employee training.

Operation of solids filtering equipment: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage: 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 operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Use as a fuel (closed systems): Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance. Wear chemical-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: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.1e7 |
| Fraction of Regional tonnage used locally: | 1.4e-1 |
| Annual site tonnage (tonnes/year): | 1.5e6 |
| Maximum daily site tonnage (kg/day): | 5.0e6 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 300 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 7.0e-4 |
| Release fraction to soil from process (initial release prior to RMM): | 0 |
| Release fraction to wastewater from process (initial release prior to RMM): | 4.4e-7 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by freshwater sediment. On-site wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater. |
| Treat air emission to provide a typical removal efficiency of (%): | 95 |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 87.7 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 5.2e6 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |

| | |
|---|--|
| Conditions and measures related to external treatment of waste for disposal: | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. |
| Conditions and measures related to external recovery of waste: | This substance is consumed during use and no waste from the substance is generated. |
| RCR - Air Compartment Driven: | 5.73E-01 |
| RCR - Water Compartment Driven: | 9.09E-01 |

Section 3:: Exposure estimation

| | |
|--|--|
| Exposure estimation and reference to its source - Environment | |
| Exposure assessment (environment): | The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |
| Exposure estimation and reference to its source - Workers | |
| Exposure assessment (human): | Not available. |

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| 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. |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|---|
| Short title of the exposure scenario | Heavy Fuel Oil Use of Substance as a Fuel - Professional |
| List of use descriptors | Identified use name: Use as a fuel - Professional Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16 Sector of end use: SU22 Subsequent service life relevant for that use: No. Environmental Release Category: ERC09a, ERC09b Specific Environmental Release Category: ESVOC SpERC 9.12b.v1 |

| | |
|---|---|
| Processes and activities covered by the exposure scenario | Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state: Liquid, vapour pressure < 0.5 kPa at STP.

Concentration of substance in product: Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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) Product sampling: 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 chemical-resistant gloves (tested to EN374) in combination with specific activity training.

General exposures (closed systems): 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

bulk closed unloading: Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour. or Ensure material transfers are under containment or extract ventilation.

Drum/batch transfers: Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear

chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour. or Ensure material transfers are under containment or extract ventilation.

refuelling: Ensure material transfers are under containment or extract ventilation. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out activities involving exposure for more than 1 hour.

Use as a fuel (closed systems): Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Equipment cleaning and maintenance: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear chemical-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.

Section 2.2:: Control of environmental exposure

| | |
|--|--|
| Product characteristics: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 3.3e5 |
| Fraction of Regional tonnage used locally: | 5.0e-4 |
| Annual site tonnage (tonnes/year): | 1.7e2 |
| Maximum daily site tonnage (kg/day): | 4.6e2 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 365 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. |
| Treat air emission to provide a typical removal efficiency of (%): | Not applicable. |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 0 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 2.3e3 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |
| Conditions and measures related to external treatment of waste for disposal: | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. |
| Conditions and measures related to external recovery of waste: | This substance is consumed during use and no waste from the substance is generated. |
| RCR - Air Compartment Driven: | 2.67E-02 |
| RCR - Water Compartment Driven: | 1.71E-01 |

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment): The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers

Exposure assessment (human): The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

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.

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 carcinogenic 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.



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Use of Substance as Intermediate - Industrial |
| List of use descriptors | Identified use name: Use as an intermediate Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU03, SU08, SU09 Subsequent service life relevant for that use: No. Environmental Release Category: ERC06a Specific Environmental Release Category: ESVOC SpERC 6.1a.v1 |

| | |
|---|---|
| Processes and activities covered by the exposure scenario | Use of substance as an intermediate within closed or contained systems (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). |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

| | |
|--|--|
| Physical state: | Liquid, vapour pressure < 0.5 kPa at STP. |
| Concentration of substance in product: | Covers percentage substance in the product up to 100% (unless stated differently). |
| Amounts used: | Not applicable. |
| Frequency and duration of use: | Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management: | Not applicable. |
| Other given operational conditions affecting workers exposure: | Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented. |

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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): Handle substance within a closed system. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

General exposures (closed systems) Process sampling Outdoor.: 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Bulk product storage: Store substance within a closed system. Avoid carrying out operation for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Fuel Oil, residual

Heavy Fuel Oil Use of Substance as Intermediate - Industrial

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

marine vessel/barge (un)loading: Avoid carrying out operation 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 chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

road tanker/rail car loading: Avoid carrying out activities involving exposure for more than 1 hour. Ensure material transfers are under containment or extract ventilation. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Equipment cleaning and maintenance: Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-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: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.3e5 |
| Fraction of Regional tonnage used locally: | 1.2e-1 |
| Annual site tonnage (tonnes/year): | 1.5e4 |
| Maximum daily site tonnage (kg/day): | 5.0e4 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 300 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 1.0e-5 |
| Release fraction to soil from process (initial release prior to RMM): | 0.001 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0e-5 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater. |
| Treat air emission to provide a typical removal efficiency of (%): | 80 |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 54.0 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 1.9e5 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |

| | |
|---|---|
| Conditions and measures related to external treatment of waste for disposal: | This substance is consumed during use and no waste from the substance is generated. |
| Conditions and measures related to external recovery of waste: | This substance is consumed during use and no waste from the substance is generated. |
| RCR - Air Compartment Driven: | 2.74E-02 |
| RCR - Water Compartment Driven: | 2.43E-01 |

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment): The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers

Exposure assessment (human): The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| 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. |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Use of Substance in Road and Construction ApplicationsI - Professional |
| List of use descriptors | Identified use name: Road and construction applications Process Category: PROC08a, PROC08b Sector of end use: SU22 Subsequent service life relevant for that use: No. Environmental Release Category: ERC08d, ERC08f Specific Environmental Release Category: ESVOC SpERC 8.15.v1 |

| | |
|---|---|
| Processes and activities covered by the exposure scenario | Covers the use of surface coatings and binders within closed or contained systems, including incidental exposures during material transfers and filling operations. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state: Liquid, vapour pressure < 0.5 kPa at STP.

Concentration of substance in product: Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure: Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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: Ensure material transfers are under containment or extract ventilation. Avoid carrying out activities involving exposure for more than 15 minutes. Limit the substance content in the product to 1%. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Equipment cleaning and maintenance: 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. Limit the substance content in the product to 1%. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Section 2.2:: Control of environmental exposure

| | |
|--|---|
| Product characteristics: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 2.2e4 |
| Fraction of Regional tonnage used locally: | 5.0e-4 |
| Annual site tonnage (tonnes/year): | 1.1e1 |
| Maximum daily site tonnage (kg/day): | 3.0e1 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 365 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. |
| Treat air emission to provide a typical removal efficiency of (%): | Not applicable. |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 30.2 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 1.1e2 |
| Assumed on-site sewage treatment plant flow (m^3/d): | 2000 |
| 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. |
| Conditions and measures related to external recovery of waste: | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
| RCR - Air Compartment Driven: | 7.89E-02 |
| RCR - Water Compartment Driven: | 2.42E-01 |

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment): The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers

Exposure assessment (human): The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| 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. |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|--|
| Short title of the exposure scenario | Heavy Fuel Oil Uses of Substance in Coatings - Industrial |
| List of use descriptors | Identified use name: Uses in Coatings - Industrial Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU03 Subsequent service life relevant for that use: No. Environmental Release Category: ERC04 Specific Environmental Release Category: ESVOC SpERC 4.3a.v1 |

| | |
|---|--|
| Processes and activities covered by the exposure scenario | Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

| | |
|--|---|
| Physical state: | Liquid, vapour pressure < 0.5 kPa at STP. |
| Concentration of substance in product: | Covers percentage substance in the product up to 100% (unless stated differently). |
| Frequency and duration of use: | Covers daily exposures up to 8 hours (unless stated differently). |
| Other given operational conditions affecting workers exposure: | Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. |

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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.

Film formation - force drying, stoving and other technologies: Provide extract ventilation to points where emissions occur. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

General exposures (closed systems): Handle substance within a closed system. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour) Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Material storage: Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. Ensure material transfers are under containment or extract ventilation.

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

Fuel Oil, residual

Heavy Fuel Oil Uses of Substance in Coatings - Industrial

Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance: Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Storage: Store substance within a closed system. Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training.

Section 2.2:: Control of environmental exposure

| | |
|--|--|
| Product characteristics: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.0e2 |
| Fraction of Regional tonnage used locally: | 1 |
| Annual site tonnage (tonnes/year): | 1.0e2 |
| Maximum daily site tonnage (kg/day): | 5.0e3 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 20 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Release fraction to air from process (initial release prior to RMM): | 0.98 |
| Release fraction to soil from process (initial release prior to RMM): | 0 |
| Release fraction to wastewater from process (initial release prior to RMM): | 2.0e-5 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater. |
| Treat air emission to provide a typical removal efficiency of (%): | 90 |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 0 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 1.1e5 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |
| 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. |
| Conditions and measures related to external recovery of waste: | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
| RCR - Air Compartment Driven: | 1.07E-01 |

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment): The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers

Exposure assessment (human): The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

| | |
|--------------------|--|
| Environment | <p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. 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.</p> |
| Health | <p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for carcinogenic 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.</p> |



Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

| | |
|--------------------|--------------------|
| Product definition | UVCB |
| Code | ST12299 |
| Product name | Fuel Oil, residual |

Section 1:: Title

| | |
|--------------------------------------|---|
| Short title of the exposure scenario | Heavy Fuel Oil Uses of Substance in Coatings - Professional |
| List of use descriptors | Identified use name: Uses in Coatings - Professional Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC15 Sector of end use: SU22 Subsequent service life relevant for that use: No. Environmental Release Category: ERC08a, ERC08d Specific Environmental Release Category: ESVOC SpERC 8.3b.v1 |

| | |
|---|--|
| Processes and activities covered by the exposure scenario | Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities. |
| Assessment Method | See Section 3 |

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

| | |
|--|---|
| Physical state: | Liquid, vapour pressure < 0.5 kPa at STP. |
| Concentration of substance in product: | Covers percentage substance in the product up to 100% (unless stated differently). |
| Frequency and duration of use: | Covers daily exposures up to 8 hours (unless stated differently). |
| Other given operational conditions affecting workers exposure: | Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. |

Contributing scenarios: Operational conditions and risk management measures

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 scenarios; 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.

Film formation - force drying, stoving and other technologies: Handle substance within a closed system. Limit the substance content in the product to 5%. Provide extract ventilation to points where emissions occur.

General exposures (closed systems): Handle substance within a closed system. Limit the substance content in the product to 5%. Provide extract ventilation to points where emissions occur.

Material transfers: Ensure material transfers are under containment or extract ventilation. Avoid carrying out activities involving exposure for more than 15 minutes. Limit the substance content in the product to 1%. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

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

Fuel Oil, residual

Heavy Fuel Oil Uses of Substance in Coatings - Professional

Equipment cleaning and maintenance: 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. Limit the substance content in the product to 1%. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Storage: Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. Store substance within a closed system.

Section 2.2:: Control of environmental exposure

| | |
|--|---|
| Product characteristics: | Substance is complex UVCB Predominantly hydrophobic |
| Amounts used: | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.0e2 |
| Fraction of Regional tonnage used locally: | 5.0e-4 |
| Annual site tonnage (tonnes/year): | 5.0e-2 |
| Maximum daily site tonnage (kg/day): | 1.4e-1 |
| Frequency and duration of use: | Continuous release. |
| Emission Days (days/year): | 365 |
| Environment factors not influenced by risk management: | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Technical conditions and measures at process level (source) to prevent release: | Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. |
| Treat air emission to provide a typical removal efficiency of (%): | Not applicable. |
| Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of ³ (%): | 0 |
| If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ³ (%): | 0 |
| Organisational 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: | |
| Estimated substance removal from wastewater via on-site sewage treatment (%): | 88.8 |
| Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs (%): | 88.8 |
| Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d): | 7.0e-1 |
| Assumed on-site sewage treatment plant flow (m³/d): | 2000 |
| 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. |
| Conditions and measures related to external recovery of waste: | External recovery and recycling of waste should comply with applicable local and/or national regulations. |
| RCR - Air Compartment Driven: | 2.67E-02 |
| RCR - Water Compartment Driven: | 1.70E-01 |

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment

Exposure assessment (environment):

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

Exposure estimation and reference to its source - Workers

Exposure assessment (human):

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

Section 4:: Guidance to check compliance with the exposure scenario

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.

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 carcinogenic 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.