

SAFETY DATA SHEET

According to EC No 1907/2006 as amended as at the date of this SDS

Cracked Residue

| | | | |
|---------|----------------|--------------|--------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 28.03.2023 |
| 3.2 | 17.02.2025 | 800001004887 | Print Date 24.02.2025 |

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

1.1 Product identifier

| | |
|------------------------|---|
| Trade name | : Cracked Residue |
| Product code | : X1928 |
| Registration number EU | : 01-2119485585-24-0002 |
| Synonyms | : Cracker Oil, Fuel Oil Blend component |
| CAS-No. | : 64742-90-1 |

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

| | |
|-----------------------------------|---|
| Use of the Sub- stance/Mixture | : Base chemical., Fuel/Solvent., Raw material for use in the chemical industry. Please refer to section 16 and/or the annexes for the registered uses under REACH. |
|-----------------------------------|---|

| | |
|----------------------|--|
| Uses advised against | : This product must not be used in applications other than the above without first seeking the advice of the supplier. |
|----------------------|--|

This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

| | |
|-------------------------------|---|
| Manufacturer/Supplier | : Shell Chemicals Europe B.V. PO Box 2334 3000 CH Rotterdam Netherlands |
| Telephone | : +31 (0)10 441 5137 / +31 (0)10 441 5191 |
| Telefax | : +31 (0)20 716 8316/ +31 (0)20 713 9230 |
| Contact for Safety Data Sheet | : sccmsds@shell.com |

1.4 Emergency telephone number

+44 (0) 1235 239 670 (This telephone number is available 24 hours per day, 7 days per week)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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

| | |
|-------------------------------------|----------------------------------|
| Germ cell mutagenicity, Category 1B | H340: May cause genetic defects. |
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Carcinogenicity, Category 1B

H350: May cause cancer.

Long-term (chronic) aquatic hazard, Category 2

H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

:



Signal word

:

Danger

Hazard statements

:

PHYSICAL HAZARDS:

Not classified as a physical hazard according to CLP criteria.

HEALTH HAZARDS:

H315 Causes skin irritation.

H340 May cause genetic defects.

H350 May cause cancer.

ENVIRONMENTAL HAZARDS:

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements

:

Prevention:

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

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P273 Avoid release to the environment.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water and soap.

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

No precautionary phrases.

Disposal:

No precautionary phrases.

2.3 Other hazards

The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

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Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Inhalation of vapours or mists may cause irritation to the respiratory system.

This material is a static accumulator.

Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.

If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

SECTION 3: Composition/information on ingredients

3.1 Substances

Components

| Chemical name | CAS-No. EC-No. | Concentration (% w/w) |
|--|-------------------------|-----------------------|
| Residues (petroleum), steam-cracked | 64742-90-1 265-193-8 | > 80 - < 85 |
| distillates (petroleum), cracked steam-cracked petroleum distillates | 68477-38-3 270-727-8 | > 15 - < 20 |

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : Not expected to be a health hazard when used under normal conditions.
- Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
- If inhaled : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
If inhalation of mists, fumes or vapour causes irritation to the nose or throat, remove to fresh air.
- In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical

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facility for additional treatment.

If contact with hot product, cool the burn area by flushing with large amounts of water for at least 15 minutes. Do not attempt to remove anything from the burn area or apply burn creams or ointments.

Do not attempt to remove anything from the burn area.

Do not apply burn creams or ointments.

Cover the burn area loosely with a sterile dressing, if available.

Transport to the nearest medical facility for additional treatment.

All burns should receive medical attention.

In case of eye contact : Flush eye with copious quantities of water.
If persistent irritation occurs, obtain medical attention.
If contact with hot product, cool the burn area by flushing with large amounts of water for at least 15 minutes. Do not attempt to remove anything from the burn area or apply burn creams or ointments.
Do not attempt to remove anything from the burn area.
Do not apply burn creams or ointments.
Remove contact lenses, if present and easy to do. Continue rinsing.
Cover the burn area loosely with a sterile dressing, if available.
Transport to the nearest medical facility for additional treatment.
All burns should receive medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.

Hot product - Contact with the skin can cause severe burns, redness, swelling, blisters and/or tissue damage.

Hot product - Contact with the eye can cause severe burns, redness, swelling, blurred vision, and may result in permanent loss of vision.

No specific hazards under normal use conditions.
Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
Call a doctor or poison control center for guidance.
Treat symptomatically.

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Potential for chemical pneumonitis.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Carbon monoxide may be evolved if incomplete combustion occurs.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.

5.3 Advice for firefighters

Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

Specific extinguishing methods : Standard procedure for chemical fires.

Further information : Clear fire area of all non-emergency personnel.
Keep adjacent containers cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Observe the relevant local and international regulations
Risk of explosion. Inform the emergency services if liquid enters surface water drains.
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
Local authorities should be advised if significant spillages cannot be contained.
6.1.1 For non emergency personnel:
Avoid contact with skin, eyes and clothing.
Be ready for fire or possible exposure.
Stay upwind and keep out of low areas.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Do not breathe fumes, vapour.
Do not operate electrical equipment.

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6.1.2 For emergency responders:
Avoid contact with skin, eyes and clothing.
Be ready for fire or possible exposure.
Stay upwind and keep out of low areas.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Do not breathe fumes, vapour.
Do not operate electrical equipment.

6.2 Environmental precautions

Environmental precautions : Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.,
For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Ensure that all local regulations regarding handling and storage facilities are followed.

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- Advice on safe handling : Avoid inhaling vapour and/or mists.
Avoid contact with skin, eyes and clothing.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Bulk storage tanks should be diked (bunded).
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges.
These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements.
These activities may lead to static discharge e.g. spark formation.
Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling.
Do NOT use compressed air for filling, discharging, or handling operations.
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
- Product Transfer : Refer to guidance under Handling section.
- Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet. Launder contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
- Further information on storage stability : Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.
Keep container tightly closed.
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Vapours from tanks should not be released to atmosphere.
Breathing losses during storage should be controlled by a suitable vapour treatment system.
Electrostatic charges will be generated during pumping.
Electrostatic discharge may cause fire. Ensure electrical con-

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- tinuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.
The storage of this product may be subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance may be obtained from the local environmental agency office.
- Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel.
Unsuitable material: Natural, butyl, neoprene or nitrile rubbers., PVC.
- Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

7.3 Specific end use(s)

- Specific use(s) : Please refer to section 16 and/or the annexes for the registered uses under REACH.

See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Biological occupational exposure limits

No biological limit allocated.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

| Substance name | End Use | Exposure routes | Potential health effects | Value |
|---|-----------|-----------------|----------------------------|-------------------|
| Residues (petroleum), steam cracked, 64742-90-1 | Workers | Dermal | Long-term systemic effects | 23.4 mg/kg bw/day |
| Residues (petroleum), steam cracked, 64742-90-1 | Workers | Inhalation | Long-term systemic effects | 3.25 mg/m3 |
| Residues (petroleum), steam cracked, 64742-90-1 | Consumers | Oral | Long-term systemic effects | 4.23 mg/kg bw/day |

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

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| Substance name | Environmental Compartment | Value |
|----------------|---|-------|
| Remarks: | Substance is a hydrocarbon with a complex, unknown or variable composition. Conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances. | |

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.
Use sealed systems as far as possible.

Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.

Local exhaust ventilation is recommended.

Firewater monitors and deluge systems are recommended.

Eye washes and showers for emergency use.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

General Information

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 there is potential for inhalation; 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.

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Eye protection : Wear goggles for use against liquids and gas.
Wear full face shield if splashes are likely to occur.
Approved to EU Standard EN166.

Hand protection

Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Viton.
Incidental contact/Splash protection: Nitrile rubber.

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For continuous contact we recommend gloves with break-through time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

- Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron. Protective clothing approved to EU Standard EN14605. Wear antistatic and flame-retardant clothing, if a local risk assessment deems it so.
- Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. If air-filtering respirators are suitable for conditions of use: Select a filter suitable for organic gases and vapours [Type A boiling point > 65°C (149°F)] meeting EN14387.
- Thermal hazards : When handling heated product, wear heat resistant gloves, safety hat with chin strap, face shield (preferably with a chin guard), safety glasses, heat resistant coveralls (with cuffs over gloves and legs over boots), neck protection and heavy duty boots, e.g. leather for heat resistance.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : Liquid at room temperature.

Colour : clear

Odour : Slight hydrocarbon

Odour Threshold : Data not available

Melting point/freezing point : > 20 °C

Boiling point/boiling range : 170 - 600 °C

Flammability

Flammability (solid, gas) : Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit /
Upper flammability limit : 7 %(V)

Lower explosion limit /
Lower flammability limit : 1 %(V)

Flash point : > 70 °C

Auto-ignition temperature : Data not available

Decomposition temperature

Decomposition temperature : Data not available

pH : Not applicable

Viscosity

Viscosity, kinematic : > 35 mm²/s (100 °C)
Method: ASTM D445

Solubility(ies)

Solubility in other solvents : Data not available

Partition coefficient: n-octanol/water : Data not available

Vapour pressure : Data not available (50 °C)

Relative density : No data available

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Density : 1,060 - 1,100 kg/m³ (15 °C)
Method: ASTM D4052

Relative vapour density : No data available

Particle characteristics
Particle size : Data not available

9.2 Other information

Explosive properties : No data available

Oxidizing properties : Data not available

Evaporation rate : Data not available

Conductivity : Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid, Medium conductivity: 100 - 10,000 pS/m

Surface tension : Data not available

SECTION 10: Stability and reactivity

10.1 Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

10.2 Chemical stability

No hazardous reaction is expected when handled and stored according to provisions

10.3 Possibility of hazardous reactions

Hazardous reactions : Stable under normal conditions of use.

10.4 Conditions to avoid

Conditions to avoid : Heat, flames, and sparks.
In certain circumstances product can ignite due to static electricity.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

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10.6 Hazardous decomposition products

Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of exposure : Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

Acute toxicity

Product:

| | |
|---------------------------|--|
| Acute oral toxicity | : LD 50 (Rat, male): > 2,000 mg/kg Method: OECD Test Guideline 401 Remarks: Based on available data, the classification criteria are not met. |
| Acute inhalation toxicity | : LC 50 (Rat, male and female): 28.1 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Test(s) equivalent or similar to OECD Test Guideline 403 Remarks: Based on available data, the classification criteria are not met. |
| Acute dermal toxicity | : LD 50 (Rat, male and female): > 2,000 mg/kg Method: OECD Test Guideline 402 Remarks: Based on available data, the classification criteria are not met. |

Components:

Residues (petroleum), steam-cracked:

| | |
|---------------------------|--|
| Acute oral toxicity | : LD 50 (Rat, male): > 2,000 mg/kg Method: OECD Test Guideline 401 Remarks: Based on available data, the classification criteria are not met. |
| Acute inhalation toxicity | : LC 50 (Rat, male and female): 28.1 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Test(s) equivalent or similar to OECD Test Guideline 403 Remarks: Based on available data, the classification criteria are not met. |
| Acute dermal toxicity | : LD 50 (Rat, male and female): > 2,000 mg/kg Method: OECD Test Guideline 402 |

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Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

| | | |
|---------|---|-------------------------|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 404 |
| Remarks | : | Causes skin irritation. |

Components:

Residues (petroleum), steam-cracked:

| | | |
|---------|---|-------------------------|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 404 |
| Remarks | : | Causes skin irritation. |

Serious eye damage/eye irritation

Product:

| | | |
|---------|---|---|
| Species | : | Rabbit |
| Method | : | Test(s) equivalent or similar to OECD Test Guideline 405 |
| Remarks | : | Based on available data, the classification criteria are not met. |

Components:

Residues (petroleum), steam-cracked:

| | | |
|---------|---|---|
| Species | : | Rabbit |
| Method | : | Test(s) equivalent or similar to OECD Test Guideline 405 |
| Remarks | : | Based on available data, the classification criteria are not met. |

Respiratory or skin sensitisation

Product:

| | | |
|---------|---|---|
| Species | : | Guinea pig |
| Method | : | Other guideline method. |
| Remarks | : | Based on available data, the classification criteria are not met. |

Components:

Residues (petroleum), steam-cracked:

| | | |
|---------|---|---|
| Species | : | Guinea pig |
| Method | : | Other guideline method. |
| Remarks | : | Based on available data, the classification criteria are not met. |

Germ cell mutagenicity

Product:

| | | |
|-----------------------|---|---|
| Genotoxicity in vitro | : | Method: Test(s) equivalent or similar to OECD Guideline 471 |
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Remarks: May cause genetic defects.

Method: Regulation (EC) No. 440/2008, Annex, B.21

Remarks: May cause genetic defects.

Genotoxicity in vivo : Species: Mouse
Method: Test(s) equivalent or similar to OECD Test Guideline 474
Remarks: May cause heritable genetic damage

Germ cell mutagenicity- Assessment : May cause genetic defects.

Components:

Residues (petroleum), steam-cracked:

Genotoxicity in vitro : Method: Test(s) equivalent or similar to OECD Guideline 471
Remarks: May cause genetic defects.

Method: Regulation (EC) No. 440/2008, Annex, B.21

Remarks: May cause genetic defects.

Genotoxicity in vivo : Species: Mouse
Method: Test(s) equivalent or similar to OECD Test Guideline 474
Remarks: May cause heritable genetic damage

Germ cell mutagenicity- Assessment : May cause genetic defects.

Carcinogenicity

Product:

Species : Rat, male and female
Application Route : Oral
Method : Other guideline method.
Remarks : May cause cancer.
Causes cancer in laboratory animals.

Species : Mouse, male and female
Application Route : Dermal
Method : Literature data
Remarks : May cause cancer.
Causes cancer in laboratory animals.

Carcinogenicity - Assessment : May cause cancer.

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Components:

Residues (petroleum), steam-cracked:

Species : Rat, male and female
Application Route : Oral
Method : Other guideline method.
Remarks : May cause cancer.
Causes cancer in laboratory animals.

Species : Mouse, male and female
Application Route : Dermal
Method : Literature data
Remarks : May cause cancer.
Causes cancer in laboratory animals.

Carcinogenicity - Assessment : May cause cancer.

| Material | GHS/CLP Carcinogenicity Classification |
|--|--|
| Residues (petroleum), steam-cracked | Carcinogenicity Category 1B |
| distillates (petroleum), cracked steam-cracked petroleum distillates | Carcinogenicity Category 1B |

Reproductive toxicity

Product:

Effects on fertility : Species: Rat
Sex: male and female
Application Route: Oral

Method: OECD Test Guideline 422
Remarks: Based on available data, the classification criteria are not met.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Components:

Residues (petroleum), steam-cracked:

Effects on fertility : Species: Rat
Sex: male and female
Application Route: Oral

Method: OECD Test Guideline 422
Remarks: Based on available data, the classification criteria

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are not met.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Product:

Remarks : Based on available data, the classification criteria are not met. Inhalation of vapours or mists may cause irritation to the respiratory system.

Components:

Residues (petroleum), steam-cracked:

Remarks : Based on available data, the classification criteria are not met. Inhalation of vapours or mists may cause irritation to the respiratory system.

STOT - repeated exposure

Product:

Remarks : Based on available data, the classification criteria are not met.

Components:

Residues (petroleum), steam-cracked:

Remarks : Based on available data, the classification criteria are not met.

Repeated dose toxicity

Product:

Species : Rat, male and female
Application Route : Oral
Method : Test(s) equivalent or similar to OECD Test Guideline 408
Target Organs : hematopoietic system

Species : Rat, male and female
Application Route : Inhalation
Test atmosphere : vapour
Method : Test(s) equivalent or similar to OECD Test Guideline 413
Target Organs : No specific target organs noted

Species : Rabbit, male and female
Application Route : Dermal
Method : Test(s) equivalent or similar to OECD Test Guideline 410
Target Organs : No specific target organs noted

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Components:

Residues (petroleum), steam-cracked:

| | | |
|-------------------|---|--|
| Species | : | Rat, male and female |
| Application Route | : | Oral |
| Method | : | Test(s) equivalent or similar to OECD Test Guideline 408 |
| Target Organs | : | hematopoietic system |

| | | |
|-------------------|---|--|
| Species | : | Rat, male and female |
| Application Route | : | Inhalation |
| Test atmosphere | : | vapour |
| Method | : | Test(s) equivalent or similar to OECD Test Guideline 413 |
| Target Organs | : | No specific target organs noted |

| | | |
|-------------------|---|--|
| Species | : | Rabbit, male and female |
| Application Route | : | Dermal |
| Method | : | Test(s) equivalent or similar to OECD Test Guideline 410 |
| Target Organs | : | No specific target organs noted |

Aspiration toxicity

Product:

Based on available data, the classification criteria are not met.

Components:

Residues (petroleum), steam-cracked:

Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

| | | |
|------------|---|---|
| Assessment | : | The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. |
|------------|---|---|

Further information

Product:

| | | |
|---------|---|---|
| Remarks | : | Classifications by other authorities under varying regulatory frameworks may exist. |
|---------|---|---|

| | | |
|---------|---|--|
| Remarks | : | Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s). |
|---------|---|--|

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Components:

Residues (petroleum), steam-cracked:

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12: Ecological information

12.1 Toxicity

Product:

| | |
|--|---|
| Toxicity to fish | : LL50 (Oncorhynchus mykiss (rainbow trout)): 1.1 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): 1.2 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
| Toxicity to algae/aquatic plants | : LOELR (Selenastrum capricornutum (green algae)): 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
| Toxicity to fish (Chronic toxicity) | : Remarks: Data not available |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : Remarks: Data not available |
| Toxicity to microorganisms | : EC50 (Activated sludge): 470 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l |

Components:

Residues (petroleum), steam-cracked:

| | |
|------------------|--|
| Toxicity to fish | : LL50 (Oncorhynchus mykiss (rainbow trout)): 1.1 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
|------------------|--|

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| | |
|--|---|
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): 1.2 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
| Toxicity to algae/aquatic plants | : LOELR (Selenastrum capricornutum (green algae)): 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Toxic LL/EL/IL50 1-10 mg/l |
| Toxicity to microorganisms | : EC50 (Activated sludge): 470 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l |
| Toxicity to fish (Chronic toxicity) | : Remarks: Data not available |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : Remarks: Data not available |

12.2 Persistence and degradability

Product:

| | |
|------------------|--|
| Biodegradability | : Biodegradation: 29 % Exposure time: 28 d Method: OECD Test Guideline 301D Remarks: Not readily biodegradable. |
|------------------|--|

Components:

Residues (petroleum), steam-cracked:

| | |
|------------------|--|
| Biodegradability | : Biodegradation: 29 % Exposure time: 28 d Method: OECD Test Guideline 301D Remarks: Not readily biodegradable. |
|------------------|--|

12.3 Bioaccumulative potential

Product:

| | |
|-----------------|--|
| Bioaccumulation | : Bioconcentration factor (BCF): 39 - 18,220 Method: Based on quantitative structure-activity relationship (QSAR) modelling Remarks: Has the potential to bioaccumulate. |
|-----------------|--|

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Components:

Residues (petroleum), steam-cracked:

Bioaccumulation : Bioconcentration factor (BCF): 39 - 18,220
Method: Based on quantitative structure-activity relationship (QSAR) modelling
Remarks: Has the potential to bioaccumulate.

12.4 Mobility in soil

Product:

Mobility : Remarks: Floats on water., If it enters soil, it will adsorb to soil particles and will not be mobile.

Components:

Residues (petroleum), steam-cracked:

Mobility : Remarks: Floats on water., If it enters soil, it will adsorb to soil particles and will not be mobile.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB..

Components:

Residues (petroleum), steam-cracked:

Assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB..

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

- Product : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
- Do not dispose into the environment, in drains or in water courses.
Waste product should not be allowed to contaminate soil or water.
- Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.
- Contaminated packaging : Drain container thoroughly.
After draining, vent in a safe place away from sparks and fire.
Residues may cause an explosion hazard.
Do not puncture, cut, or weld uncleaned drums.
Send to drum recoverer or metal reclaimer.
- Local legislation
Remarks : Hazardous Waste (England and Wales) Regulations 2005.

SECTION 14: Transport information

14.1 UN number or ID number

- ADR : 3082
RID : 3082
IMDG : 3082
IATA : 3082

14.2 UN proper shipping name

- ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(CRACKER OIL)
- RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(CRACKER OIL)
- IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(CRACKER OIL)

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IATA : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S.
(CRACKER OIL)

14.3 Transport hazard class(es)

| | |
|-------------|-----|
| ADR | : 9 |
| RID | : 9 |
| IMDG | : 9 |
| IATA | : 9 |

14.4 Packing group

ADR
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9

RID
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9

IMDG
Packing group : III
Labels : 9

IATA
Packing group : III
Labels : 9

14.5 Environmental hazards

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

14.6 Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage,
for special precautions which a user needs to be aware of or
needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

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SECTION 15: Regulatory information

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

| | |
|--|--|
| REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) | : Conditions of restriction for the following entries should be considered: Residues (petroleum), steam-cracked (Number on list 28) distillates (petroleum), cracked steam-cracked petroleum distillates (Number on list 28) |
| REACH - List of substances subject to authorisation (Annex XIV) | : Product is not subject to Authorisation under REACH. |
| REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). | : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57). |

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Environmental Protection Act 1990 (as amended). Health and Safety at Work etc. Act 1974. Consumers Protection Act 1987. Pollution Prevention and Control Act 1999. Environment Act 1995. Factories Act 1961. The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011. Chemicals (Hazard Information and Packaging for Supply) Regulations 2009. Control of Substances Hazardous to Health Regulations 2002 (as amended). Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (as amended). Personal Protective Equipment Regulations 2002. Personal Protective Equipment at Work Regulations 1992. Hazardous Waste (England and Wales) Regulations 2005(as amended). Control of Major Accident Hazards Regulations 1999 (as amended). Renewable Transport Fuel Obligations Order 2007 (as amended). Energy Act 2011. Environmental Permitting (England and Wales) Regulations 2010 (as amended). Waste (England and Wales) Regulations 2011 (as amended). Planning (Hazardous Substances) Act 1990 and associated regulations. The Environmental Protection (Controls on Ozone-Depleting Substances) Regulations 2011.

Product is subject to the Control of Major Accident Hazards Regulations 2015 (2015 No. 483) based on Seveso III directive (2012/18/EU).

The components of this product are reported in the following inventories:

| | |
|------|---|
| TSCA | : Listed |
| AIIC | : Listed |
| NDSL | : This product contains one or several components listed in the |

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Canadian NDSL.

KECI : Listed

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Training advice : Provide adequate information, instruction and training for operators.

Other information : For Industry guidance and tools on REACH please visit the CEFIC website at <http://cefic.org/Industry-support>.

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The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

A vertical bar (|) in the left margin indicates an amendment from the previous version.

Sources of key data used to compile the Safety Data Sheet : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID data base, EC 1272 regulation, etc).

Identified Uses according to the Use Descriptor System

Uses - Worker

Title : Manufacture of substance
- Industrial

Uses - Worker

Title : Distribution of substance
- Industrial

Uses - Worker

Title : Use as an intermediate
- Industrial

Uses - Worker

Title : Formulation & (re)packing of substances and mixtures
- Industrial

Uses - Worker

Title : Use as a fuel
- Industrial

Uses - Worker

Title : Use as a fuel
- Professional

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GB / EN

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000984 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Manufacture of substance- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 15 Environmental Release Categories: ERC1 |
| Scope of process | 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). |

| | |
|--|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Section 2.1 | Control of Worker Exposure |
| Product Characteristics | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting 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 | 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 maintain all control measures. Consider the need for risk based health surveillance. |
| General measures (skin irritants). | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if |

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| | |
|--|---|
| | hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| General exposures (closed systems) | Handle substance within a closed system. |
| General exposures (closed systems)with sample collectionGeneral measures (skin irritants). | Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure |
| General exposures (closed systems)Use in contained batch processes | Handle substance within a predominantly closed system provided with extract ventilation. Provide extraction ventilation at points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Process sampling | Sample via a closed loop or other system to avoid exposure 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. |
| Laboratory activities | Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. |
| Bulk transfers(open systems)with potential for aerosol generation. | 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. |
| Bulk transfers(closed systems) | Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. |
| Equipment cleaning and maintenance | Drain down and flush system prior to equipment opening or maintenance. Wear a respirator conforming to EN140 with Type A filter or better. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |

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| | |
|---|--|
| Storage.General measures (skin irritants). | Sample via a closed loop or other system to avoid exposure Handle substance within a closed system. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |
| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.2 |
| Regional use tonnage (tonnes/year): | 2.0E+05 |
| Fraction of Regional tonnage used locally: | 0.8 |
| Annual site tonnage (tonnes/year): | 1.6E+05 |
| Maximum daily site tonnage (kg/day): | 5.3E+05 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 300 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 40 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 1.0E-03 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0E-04 |
| Release fraction to soil from process (initial release prior to RMM): | 1.0E-04 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process re-release estimates used. | |
| Technical onsite 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 inhalation). | |
| If discharging to domestic sewage treatment plant, no secondary 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 onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) | 43.6 |
| If discharging to domestic sewage treatment plant, no secondary wastewater treatment required. | 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 | |

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| | |
|---|---------|
| Estimated substance removal from wastewater via domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 94.9 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 5.3E+05 |
| Assumed domestic sewage treatment plant flow (m3/d) | 10,000 |
| 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. | |

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| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. | |

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| Section 3.2 -Environment | |
| The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. | |

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| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |
| Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. | |

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| Section 4.2 -Environment | |
| Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. | |
| Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. | |
| Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. | |
| Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org). | |

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Exposure Scenario - Worker

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|-------------------------|---|
| 300000000985 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Distribution of substance- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 9, PROC 15 Environmental Release Categories: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC7, ESVOC SpERC 1.1b.v1 |
| Scope of process | Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Section 2.1 | Control of Worker Exposure | |
| Product Characteristics | | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP | |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting 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 | | 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 maintain all control measures. Consider the need for risk based health surveillance. |
| General measures (skin irritants). | | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamina- |

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| | tion/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| General exposures (closed systems) | Handle substance within a closed system. |
| General exposures (closed systems)with sample collectionGeneral measures (skin irritants). | Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure |
| General exposures (closed systems)Use in contained batch processes | Handle substance within a closed system. Provide extraction ventilation at points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Process sampling | Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure 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. |
| Laboratory activities | Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. |
| Bulk 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. |
| Drum and small package filling | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). |
| Equipment cleaning and maintenance | Drain down and flush system prior to equipment opening or maintenance. Wear a respirator conforming to EN140 with Type A filter or better. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |
| Storage.General measures | Store substance within a closed system. |

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| (skin irritants). | Sample via a closed loop or other system to avoid exposure |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |
| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.0E+05 |
| Fraction of Regional tonnage used locally: | 0.002 |
| Annual site tonnage (tonnes/year): | 2.0E+02 |
| Maximum daily site tonnage (kg/day): | 1.0E+04 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 20 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 1.0E-04 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0E-05 |
| Release fraction to soil from process (initial release prior to RMM): | 1.0E-05 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process re-release estimates used. | |
| Technical onsite 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 onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) | 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 domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 94.9 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 2.6E+05 |
| Assumed domestic sewage treatment plant flow (m3/d) | 2,000 |
| Conditions and Measures related to external treatment of waste for disposal | |
| During manufacturing no waste of the substance is generated. | |

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Conditions and measures related to external recovery of waste

During manufacturing no waste of the substance is generated.

SECTION 3

EXPOSURE ESTIMATION

Section 3.1 - Health

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

Section 3.2 -Environment

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

SECTION 4

GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

Section 4.1 - Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Section 4.2 -Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org>).

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Exposure Scenario - Worker

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| 300000000986 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as an intermediate- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 15 Environmental Release Categories: ERC6a |
| Scope of process | 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). |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Section 2.1 | Control of Worker Exposure |
| Product Characteristics | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting 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 | 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 maintain all control measures. Consider the need for risk based health surveillance. |
| General measures (skin irritants). | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if |

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| | hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| General exposures (closed systems) | Handle substance within a closed system. |
| General exposures (closed systems)with sample collectionGeneral measures (skin irritants). | Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure |
| General exposures (closed systems)Use in contained batch processes | Handle substance within a predominantly closed system provided with extract ventilation. Provide extraction ventilation at points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Process sampling | Sample via a closed loop or other system to avoid exposure 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. |
| Laboratory activities | Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. |
| Bulk transfers(open systems)with potential for aerosol generation. | 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. |
| Bulk transfers(closed systems) | Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. |
| Equipment cleaning and maintenance | Drain down and flush system prior to equipment opening or maintenance. Clear spills immediately. Wear a respirator conforming to EN140 with Type A filter or better. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |

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| Storage.General measures (skin irritants). | Sample via a closed loop or other system to avoid exposure Store substance within a closed system. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |
| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 2.0E+04 |
| Fraction of Regional tonnage used locally: | 0.75 |
| Annual site tonnage (tonnes/year): | 1.5E+04 |
| Maximum daily site tonnage (kg/day): | 5.0E+04 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 300 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 2.0E-04 |
| Release fraction to wastewater from process (initial release prior to RMM): | 3.0E-04 |
| Release fraction to soil from process (initial release prior to RMM): | 1.0E-03 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process re-release estimates used. | |
| Technical onsite 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 (%) | 80 |
| Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) | 99.7 |
| If discharging to domestic sewage treatment plant, no secondary wastewater treatment required. | 94.1 |
| 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 | |

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| Estimated substance removal from wastewater via domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 99.7 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 5.0E+04 |
| Assumed domestic sewage treatment plant flow (m3/d) | 2,000 |
| Conditions and Measures related to external treatment of waste for disposal | |
| This substance is consumed during use and no waste of substance is generated. | |
| Conditions and measures related to external recovery of waste | |
| This substance is consumed during use and no waste of substance is generated. | |

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| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. | |

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| Section 3.2 -Environment | |
| The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. | |

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| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |
| Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. | |

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| Section 4.2 -Environment | |
| Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. | |
| Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. | |
| Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. | |
| Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org). | |

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Exposure Scenario - Worker

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| 300000000987 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Formulation & (re)packing of substances and mixtures- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU 10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 9, PROC 15 Environmental Release Categories: ERC2 |
| Scope of process | 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. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Section 2.1 | Control of Worker Exposure |
| Product Characteristics | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting 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 | 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 maintain all control measures. Consider the need for risk based health surveillance. |
| General measures (skin irritants). | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if |

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| | hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| General exposures (closed systems) | Handle substance within a closed system. |
| General exposures (closed systems)with sample collectionGeneral measures (skin irritants). | Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| General exposures (closed systems)Use in contained batch processes | Handle substance within a closed system. Provide extraction ventilation at points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Batch processes at elevated temperatures | Handle substance within a closed system. Provide extraction ventilation at points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure material transfers are under containment or extract ventilation. Ensure operation is undertaken outdoors. |
| Process sampling | Sample via a closed loop or other system to avoid exposure Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| Laboratory activities | Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. |
| Bulk transfers | Ensure material transfers are under containment or extract ventilation. Avoid carrying out activities involving exposure for more than 4 hours |
| ManualTransfer from/pouring from containers | 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. |

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| 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 4 hours |
| Drum and small package filling | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Equipment cleaning and maintenance | Drain down and flush system prior to equipment opening or maintenance. Wear a respirator conforming to EN140 with Type A filter or better. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |
| Storage.General measures (skin irritants). | Store substance within a closed system. Ensure operation is undertaken outdoors. Ensure material transfers are under containment or extract ventilation. |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |
| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 8.0E+04 |
| Fraction of Regional tonnage used locally: | 0.375 |
| Annual site tonnage (tonnes/year): | 3.0E+04 |
| Maximum daily site tonnage (kg/day): | 1.0E+05 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 300 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 1.0E-03 |
| Release fraction to wastewater from process (initial release prior to RMM): | 2.0E-04 |
| Release fraction to soil from process (initial release prior to RMM): | 1.0E-04 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process release estimates used. | |

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| | |
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| Technical onsite 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 secondary 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 onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%) | 82.8 |
| 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 domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 94.9 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 1.0E+05 |
| Assumed domestic sewage treatment plant flow (m ³ /d) | 2,000 |
| Conditions and Measures related to external treatment of waste for disposal | |
| External treatment and disposal of waste should comply with applicable local and/or regional regulations. | |
| Conditions and measures related to external recovery of waste | |
| External recovery and recycling of waste should comply with applicable local and/or regional regulations. | |

| | |
|---|----------------------------|
| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. | |

| | |
|--|--|
| Section 3.2 -Environment | |
| The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. | |

| | |
|---|--|
| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |
| Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. | |

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| Section 4.2 -Environment |
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| 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. |
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| Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. |
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| Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. |
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| Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org). |
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Exposure Scenario - Worker

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| 300000000988 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as a fuel- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU 10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 16 Environmental Release Categories: ERC7 |
| Scope of process | 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. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Section 2.1 | Control of Worker Exposure | |
| Product Characteristics | | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP | |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting 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 | 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 maintain all control measures. Consider the need for risk based health surveillance. | |
| General measures (skin irritants). | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contami- | |

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| | nation immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Bulk transfers | Handle substance within a predominantly closed system provided with 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 4 hours |
| Drum/batch transfers | Use drum pumps. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. |
| General exposures (closed systems) | Handle substance within a closed system. |
| Use as a fuel(closed systems) | Handle substance within a closed system. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). |
| Use as a fuel(open systems) | Handle substance within a predominantly closed system provided with extract ventilation. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). |
| Equipment maintenance | Drain down system prior to equipment opening or maintenance. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |
| Storage. | Store substance within a closed system. |
| Storage.General measures (skin irritants). | Store substance within a closed system. Sample via a closed loop or other system to avoid exposure Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |

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| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.2 |
| Regional use tonnage (tonnes/year): | 1.1E+05 |
| Fraction of Regional tonnage used locally: | 1.4 |
| Annual site tonnage (tonnes/year): | 1.6E+05 |
| Maximum daily site tonnage (kg/day): | 5.3E+05 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 300 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 2.5E-04 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0E-05 |
| Release fraction to soil from process (initial release prior to RMM): | 0 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | |
| Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). | |
| 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 (%) | 95.0 |
| Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) | 0 |
| If discharging to domestic sewage treatment plant, no secondary wastewater treatment required. | 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 domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 94.9 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 1.9E+05 |
| Assumed domestic sewage treatment plant flow (m3/d) | 2,000 |
| Conditions and Measures related to external treatment of waste for disposal | |
| This substance is consumed during use and no waste of substance is generated. | |
| Conditions and measures related to external recovery of waste | |
| This substance is consumed during use and no waste of substance is generated. | |

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| SECTION 3 | EXPOSURE ESTIMATION |
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| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. | |

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| Section 3.2 -Environment | |
| The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. | |

| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
|---|---|
| Section 4.1 - Health | |
| Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. | |

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| Section 4.2 -Environment | |
| Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. | |
| Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. | |
| Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. | |
| Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org). | |

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Exposure Scenario - Worker

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| 300000000989 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as a fuel- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 16 Environmental Release Categories: ERC9a, ERC9b, ESVOC SpERC 9.12b.v1 |
| Scope of process | 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. |

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|---|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Section 2.1 | Control of Worker Exposure |
| Product Characteristics | |
| Physical form of product | Liquid, vapour pressure < 0.5 kPa at STP |
| Concentration of the Substance in Mixture/Article | Covers use of substance/product up to 100% (unless stated differently)., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting 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 | 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 maintain all control measures. Consider the need for risk based health surveillance. |
| General measures (skin irritants). | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamina- |

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| | tion/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Bulk transfers | 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 4 hours Clear transfer lines prior to de-coupling. |
| Drum/batch transfers | Use drum pumps or carefully pour from container. 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 4 hours |
| General exposures (closed systems) | Handle substance within a closed system. |
| Use as a fuel(closed systems) | Handle substance within a closed system. 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. |
| Use as a fuel(open systems) | Handle substance within a predominantly closed system provided with 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. |
| Equipment cleaning and maintenance | Drain down and flush system prior to equipment opening or maintenance. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). , or: Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better. |

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| | Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle. |
| Storage. | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |
| Substance is complex UVCB. | |
| Predominantly hydrophobic. | |
| Not readily biodegradable. | |
| Amounts Used | |
| Fraction of EU tonnage used in region: | 0.1 |
| Regional use tonnage (tonnes/year): | 1.6E+04 |
| Fraction of Regional tonnage used locally: | 5.0E-04 |
| Annual site tonnage (tonnes/year): | 8.0 |
| Maximum daily site tonnage (kg/day): | 21.9 |
| Frequency and Duration of Use | |
| Continuous release. | |
| Emission Days (days/year): | 365 |
| Environmental factors not influenced by risk management | |
| Local freshwater dilution factor: | 10 |
| Local marine water dilution factor: | 100 |
| Other Operational Conditions affecting Environmental Exposure | |
| Release fraction to air from process (initial release prior to RMM): | 1.0E-03 |
| Release fraction to wastewater from process (initial release prior to RMM): | 1.0E-05 |
| Release fraction to soil from process (initial release prior to RMM): | 1.0E-05 |
| Technical conditions and measures at process level (source) to prevent release | |
| Common practices vary across sites thus conservative process release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | |
| Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). | |
| No wastewater treatment required. | |
| Negligible air emissions as process operates in a contained system. | |
| Treat air emission to provide a typical removal efficiency of (%) | 0 |
| Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) | 0 |
| If discharging to domestic sewage treatment plant, no secondary wastewater treatment required. | 0 |
| Organisational measures to prevent/limit release from site | |
| Prevent environmental discharge consistent with regulatory requirements. | |
| Conditions and Measures related to municipal sewage treatment plant | |
| Estimated substance removal from wastewater via domestic sewage treatment (%) | 94.9 |
| Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) | 94.9 |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) | 8.0E+02 |

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| | |
|--|-------|
| Assumed domestic sewage treatment plant flow (m3/d) | 2,000 |
| Conditions and Measures related to external treatment of waste for disposal | |
| This substance is consumed during use and no waste of substance is generated. | |
| Conditions and measures related to external recovery of waste | |
| This substance is consumed during use and no waste of substance is generated. | |

| | |
|---|----------------------------|
| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. | |

| | |
|--|--|
| Section 3.2 -Environment | |
| The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. | |

| | |
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| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |
| Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. | |

| | |
|--|--|
| Section 4.2 -Environment | |
| Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. | |
| Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. | |
| Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. | |
| Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org). | |