

SAFETY DATA SHEET

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

Diethylene Glycol

| | | | |
|---------|----------------|--------------|--------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 30.07.2024 |
| 3.4 | 12.02.2025 | 800001033914 | Print Date 19.02.2025 |

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

1.1 Product identifier

| | |
|------------------------|---|
| Trade name | : Diethylene Glycol |
| Product code | : U1237, U1239 |
| Registration number EU | : 01-2119457857-21-0001, 01-2119457857-21-0003 |
| Synonyms | : 2,2' Dihydroxy diethyl ether, bis (2-hydroxyethyl) ether, DEG, Diglycol, Digol, Ethylene diglycol |
| CAS-No. | : 111-46-6 |

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

| | |
|------------------------------|---|
| Use of the Substance/Mixture | : Chemical intermediate. 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., Do not use in the manufacture or preparation of foods or pharmaceuticals., Keep out of reach of children and pets., Do not use in theatrical fogs or other artificial smoke generator applications., Do not use in aircraft deicing applications. 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)
Instituto Nacional de Toxicologia: +34 91 562 04 20
+44 (0) 1235 239 670 (Este número de teléfono esta disponibles las 24 horas del día, 7 días de la semana)

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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4, Oral

H302: Harmful if swallowed.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Warning

Hazard statements :
PHYSICAL HAZARDS:
Not classified as a physical hazard according to CLP criteria.
HEALTH HAZARDS:
H302 Harmful if swallowed.
ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
Response:
P301 + P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P330 Rinse mouth.
Storage:
No precautionary phrases.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

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.

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Slightly irritating to the skin.
Slightly irritating to respiratory system.
Slightly irritating to the eye.
Vapours may be irritating to the eye.

SECTION 3: Composition/information on ingredients

3.1 Substances

Components

| Chemical name | CAS-No. EC-No. | Concentration (% w/w) |
|-------------------|-----------------------|-----------------------|
| Diethylene glycol | 111-46-6 203-872-2 | 95 - 100 |

Further information

Contains:

| Chemical name | Identification number | Classification | Concentration (% w/w) |
|---------------|-----------------------|-------------------------------------|-----------------------|
| Ethanediol | 107-21-1, 203-473-3 | Acute Tox.4; H302 STOT RE2; H373 | <= 0,15 |

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.
- In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.
- In case of eye contact : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.
- If swallowed : If swallowed, do not induce vomiting: transport to nearest

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medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Not considered to be an inhalation hazard under normal conditions of use.
Possible respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
No specific hazards under normal use conditions.
Skin irritation signs and symptoms may include a burning sensation, redness, or swelling.
Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.
Ingestion may result in nausea, vomiting and/or diarrhoea.
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Kidney toxicity may be recognized by blood in the urine or increased or decreased urine flow. Other signs and symptoms can include nausea, vomiting, abdominal cramps, diarrhoea, lumbar pain shortly after ingestion, and possibly narcosis and death.

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.
May cause significant renal, respiratory, and CNS toxicity.
May cause significant acidosis.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Alcohol-resistant 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 : Material will not burn unless preheated.
Carbon monoxide may be evolved if incomplete combustion occurs.
Containers exposed to intense heat from fires should be cooled with large quantities of water.

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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 : Evacuate the area of all non-essential 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 all relevant local and international regulations.
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.
6.1.2 For emergency responders:
Avoid contact with skin, eyes and clothing.

6.2 Environmental precautions

- Environmental precautions : Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Use appropriate containment to avoid environmental contamination.
Ventilate contaminated area thoroughly.

6.3 Methods and material for containment and cleaning up

- Methods for cleaning up : Contain run-off from residue flush and dispose of properly.
Soak up residue with an absorbent such as clay, sand or other suitable material.
- 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

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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. |
| Advice on safe handling | : Use local exhaust extraction over processing area. Handle and open container with care in a well-ventilated area. Do not empty into drains. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Handling Temperature: Ambient. |
| Product Transfer | : Keep containers closed when not in use. Do not pressurize drum containers to empty. |
| 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 | : Tanks must be clean, dry and rust-free. Keep container tightly closed. Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. Drums should be stacked to a maximum of 3 high. Storage Temperature: Ambient. |

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Packaging material : Suitable material: Stainless steel., Mild steel., Carbon steel
Unsuitable material: Data not available

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.

Ensure that all local regulations regarding handling and storage facilities are followed.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

| Components | CAS-No. | Value type (Form of exposure) | Control parameters | Basis |
|--|----------|-------------------------------|---------------------------------|------------|
| Ethanediol | 107-21-1 | VLA-EC | 40 ppm 104 mg/m ³ | ES VLA |
| Further information: Skin | | | | |
| Ethanediol | | VLA-ED | 20 ppm 52 mg/m ³ | ES VLA |
| Further information: Skin | | | | |
| Ethanediol | | STEL | 40 ppm 104 mg/m ³ | 2000/39/EC |
| Further information: Identifies the possibility of significant uptake through the skin, Indicative | | | | |
| Ethanediol | | TWA | 20 ppm 52 mg/m ³ | 2000/39/EC |
| Further information: Identifies the possibility of significant uptake through the skin, Indicative | | | | |

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 |
|-------------------|-----------|-----------------|----------------------------|----------------------|
| Diethylene glycol | Workers | Dermal | Long-term systemic effects | 43 mg/kg bw/day |
| Diethylene glycol | Workers | Inhalation | Long-term local effects | 60 mg/m ³ |
| Diethylene glycol | Consumers | Dermal | Long-term systemic effects | 21 mg/kg bw/day |
| Diethylene glycol | Consumers | Inhalation | Long-term local effects | 12 mg/m ³ |

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

| Substance name | Environmental Compartment | Value |
|-------------------|--|-------|
| Diethylene glycol | | |
| Remarks: | Exposure assessments have not been presented for the environment therefore PNEC values not required. | |

8.2 Exposure controls

Engineering measures

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:

Adequate ventilation to control airborne concentrations.

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

Eye washes and showers for emergency use.

General Information

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

Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

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

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

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 : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
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: Nitrile rubber gloves. Incidental contact/Splash protection: PVC or neoprene rubber gloves. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we

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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 : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.
Protective clothing approved to EU Standard EN14605.
- 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 the combination of organic gases and vapours and particles meeting EN14387 and EN143 [Filter type A/P for use against certain organic gases and vapours with a boiling point >65°C (149°F) and for use against particles].
- Thermal hazards : Not applicable

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Physical state : Slightly viscous liquid.
- Colour : colourless
- Odour : mild

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Odour Threshold : Data not available

Melting point/freezing point : -10 °C

Boiling point/boiling range : 244 - 250 °C

Flammability

Flammability (solid, gas) : Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit /
Upper flammability limit : 10,8 %(V)

Lower explosion limit /
Lower flammability limit : 1,6 %(V)

Flash point : 149 °C
Method: Pensky-Martens closed cup

Auto-ignition temperature : 365 °C

Decomposition temperature
Decomposition temperature : Data not available

pH : Not applicable

Viscosity

Viscosity, dynamic : Data not available

Viscosity, kinematic : 33 mm²/s (20 °C)
Method: ASTM D445

Solubility(ies)

Water solubility : completely soluble

Partition coefficient: n-
octanol/water : log Pow: -1,98

Vapour pressure : < 1,3 Pa (20 °C)

Relative density : 1,12
Method: ASTM D4052

Density : 1.116 g/cm³ (20 °C)
Method: ASTM D4052

Relative vapour density : 3,7

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Particle characteristics

Particle size : Data not available

9.2 Other information

Explosive properties : Not applicable

Oxidizing properties : Data not available

Evaporation rate : < 0,01
Method: ASTM D 3539, nBuAc=1

Conductivity : Electrical conductivity: > 10,000 pS/m

A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid, This material is not expected to be a static accumulator.

Surface tension : Data not available

Molecular weight : 106,12 g/mol

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
Oxidises on contact with air.

10.3 Possibility of hazardous reactions

Hazardous reactions : None known.

10.4 Conditions to avoid

Conditions to avoid : Extremes of temperature and direct sunlight.

Product cannot ignite due to static electricity.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.
Strong acids.
Strong bases.

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 or-

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ganic 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

Components:

Diethylene glycol:

| | |
|---------------------------|--|
| Acute oral toxicity | : LD 50 (Rat, male and female): > 5.000 mg/kg Method: Literature data Remarks: Harmful if swallowed. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 milliliters (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs. |
| Acute inhalation toxicity | : LC 50 (Rat): Exposure time: 4 h Test atmosphere: Aerosol Method: Literature data Remarks: LC50 greater than near-saturated vapour concentration. Based on available data, the classification criteria are not met. |
| Acute dermal toxicity | : LD 50 (Rabbit): > 5.000 mg/kg Method: Literature data Remarks: Based on available data, the classification criteria are not met. |

Skin corrosion/irritation

Components:

Diethylene glycol:

| | |
|---------|---|
| Species | : Rabbit |
| Method | : Literature data |
| Remarks | : Based on available data, the classification criteria are not met. |

Serious eye damage/eye irritation

Components:

Diethylene glycol:

| | |
|---------|----------|
| Species | : Rabbit |
|---------|----------|

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| | | |
|---------|---|---|
| Method | : | Literature data |
| Remarks | : | Based on available data, the classification criteria are not met. |

Respiratory or skin sensitisation

Components:

Diethylene glycol:

| | | |
|---------|---|---|
| Species | : | Guinea pig |
| Method | : | Regulation (EC) No. 440/2008, Annex, B.6 |
| Remarks | : | Based on available data, the classification criteria are not met. |

| | | |
|--------|---|--|
| Method | : | Tested according to Annex V of Directive 67/548/EEC. |
|--------|---|--|

Germ cell mutagenicity

Components:

Diethylene glycol:

| | | |
|-----------------------|---|---|
| Genotoxicity in vitro | : | Method: OECD Test Guideline 471 Remarks: Based on available data, the classification criteria are not met. |
|-----------------------|---|---|

| | | |
|--|---|---|
| | : | Method: OECD Test Guideline 473 Remarks: Based on available data, the classification criteria are not met. |
|--|---|---|

| | | |
|--|---|---|
| | : | Method: OECD Test Guideline 476 Remarks: Based on available data, the classification criteria are not met. |
|--|---|---|

| | | |
|--|---|---|
| | : | Method: OECD Test Guideline 479 Remarks: Based on available data, the classification criteria are not met. |
|--|---|---|

| | | |
|----------------------|---|---|
| Genotoxicity in vivo | : | Species: Mouse Method: OECD Test Guideline 474 Remarks: Based on available data, the classification criteria are not met. |
|----------------------|---|---|

| | | |
|------------------------------------|---|---|
| Germ cell mutagenicity- Assessment | : | This product does not meet the criteria for classification in categories 1A/1B. |
|------------------------------------|---|---|

Carcinogenicity

Components:

Diethylene glycol:

| | | |
|-------------------|---|---|
| Species | : | Rat, male and female |
| Application Route | : | Oral |
| Method | : | Literature data |
| Remarks | : | Based on available data, the classification criteria are not met. |

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Tumours produced in animals are not considered relevant to humans.

Carcinogenicity - Assessment

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

| Material | GHS/CLP Carcinogenicity Classification |
|-------------------|--|
| Diethylene glycol | No carcinogenicity classification. |
| Ethanediol | No carcinogenicity classification. |

Reproductive toxicity

Components:

Diethylene glycol:

Effects on fertility

: Species: Mouse
Sex: male and female
Application Route: Oral

Method: Acceptable non-standard method.

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.

STOT - single exposure

Components:

Diethylene glycol:

Remarks

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

STOT - repeated exposure

Components:

Diethylene glycol:

Remarks

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

Repeated dose toxicity

Components:

Diethylene glycol:

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| | | |
|-------------------|---|---------------------------------|
| Species | : | Rat, male and female |
| Application Route | : | Oral |
| Method | : | Acceptable non-standard method. |
| Target Organs | : | No specific target organs noted |

| | | |
|---------------|---|-----------|
| NOAEL | : | 300 mg/kg |
| Exposure time | : | 98 Days |

| | | |
|---------------|---|------------|
| LOAEL | : | 1500 mg/kg |
| Exposure time | : | 98 Days |

| | | |
|-------------------|---|---------------------------------|
| Species | : | Dog, male |
| Application Route | : | Dermal |
| Method | : | OECD Test Guideline 410 |
| Target Organs | : | No specific target organs noted |

| | | |
|-------|---|------------|
| NOAEL | : | 4440 mg/kg |
|-------|---|------------|

| | | |
|-------|---|------------|
| LOAEL | : | 8880 mg/kg |
|-------|---|------------|

Aspiration toxicity

Components:

Diethylene glycol:

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

Components:

Diethylene glycol:

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

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SECTION 12: Ecological information

12.1 Toxicity

Components:

Diethylene glycol:

- | | | |
|--|---|---|
| Toxicity to fish | : | LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l Exposure time: 96 h Method: Literature data. Remarks: Practically non toxic: Method: Other guideline method. Remarks: LL/EL/IL50 > 100 mg/l |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: Other guideline method. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l |
| Toxicity to algae/aquatic plants | : | EC50 (Scenedesmus quadricauda (Green algae)): > 100 mg/l Exposure time: 72 h Method: Information given is based on data obtained from similar substances. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l |
| Toxicity to microorganisms | : | EC20 (Activated sludge, domestic waste): > 1.000 mg/l Exposure time: 3 h Method: Test(s) equivalent or similar to OECD Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l |
| Toxicity to fish (Chronic toxicity) | : | NOEC: > 40 mg/l Exposure time: 28 d Species: Pimephales promelas (fathead minnow) Method: Information given is based on data obtained from similar substances. Remarks: NOEC/NOEL > 100 mg/l |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : | NOEC: > 100 mg/l Species: Ceriodaphnia dubia (Water flea) Method: Information given is based on data obtained from similar substances. Remarks: NOEC/NOEL > 100 mg/l |

12.2 Persistence and degradability

Components:

Diethylene glycol:

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Biodegradability : Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Remarks: Inherently biodegradable.

12.3 Bioaccumulative potential

Components:

Diethylene glycol:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

12.4 Mobility in soil

Components:

Diethylene glycol:

Mobility : Remarks: If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.,
Dissolves in water.

12.5 Results of PBT and vPvB assessment

Components:

Diethylene glycol:

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).

Components:

Diethylene glycol:

Additional ecological information : Data not available

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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.
- Remove all packaging for recovery or waste disposal.
- Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
- Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
- Do not dispose into the environment, in drains or in water courses.
- Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- 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.
- MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.
- Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

SECTION 14: Transport information

14.1 UN number or ID number

- ADR : Not regulated as a dangerous good
- RID : Not regulated as a dangerous good
- IMDG : Not regulated as a dangerous good
- IATA : Not regulated as a dangerous good

14.2 UN proper shipping name

- ADR : Not regulated as a dangerous good
- RID : Not regulated as a dangerous good
- IMDG : Not regulated as a dangerous good

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IATA : Not regulated as a dangerous good

14.3 Transport hazard class(es)

ADR : Not regulated as a dangerous good

RID : Not regulated as a dangerous good

IMDG : Not regulated as a dangerous good

IATA : Not regulated as a dangerous good

14.4 Packing group

ADR : Not regulated as a dangerous good

RID : Not regulated as a dangerous good

IMDG : Not regulated as a dangerous good

IATA : Not regulated as a dangerous good

14.5 Environmental hazards

ADR : Not regulated as a dangerous good

RID : Not regulated as a dangerous good

IMDG : Not regulated as a dangerous good

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

| | |
|--------------------|---------------------|
| Pollution category | : Z |
| Ship type | : 3 |
| Product name | : Diethylene glycol |

Additional Information : This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

Transport in bulk according to Annex II of Marpol and the IBC Code

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation (Annex XIV) : Product is not subject to Authorisation under REACH.

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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.

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

| | |
|-------|----------|
| DSL | : Listed |
| IECSC | : Listed |
| ENCS | : Listed |
| KECI | : Listed |
| NZIoC | : Listed |
| PICCS | : Listed |
| TSCA | : Listed |
| TCSI | : 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

| | |
|-------------------|--|
| 2000/39/EC | : Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values |
| ES VLA | : Spain. Environmental Limits for exposure to Chemical agents - Table 1: Occupational Exposure Values |
| 2000/39/EC / TWA | : Limit Value - eight hours |
| 2000/39/EC / STEL | : Short term exposure limit |
| ES VLA / VLA-ED | : Environmental Daily Limit Value |
| ES VLA / VLA-EC | : Environmental Short Term Value |

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 -

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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>.
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.

This product is classified as R22/H302 Harmful if swallowed. The same control advice applies to all uses of this product and is included in Section 8 of the SDS. An exposure scenario is not presented.

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).

Classification of the mixture:

Acute Tox. 4 H302

Classification procedure:

Expert judgement and weight of evi-

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dence determination.

Identified Uses according to the Use Descriptor System

Uses - Worker

Title : Manufacture of substance
- Industrial

Uses - Worker

Title : Use as an intermediate
- Industrial

Uses - Worker

Title : Distribution of substance
- Industrial

Uses - Worker

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

Uses - Worker

Title : Uses in Coatings
- Industrial

Uses - Worker

Title : Uses in Coatings
- Professional

Uses - Worker

Title : Use in Cleaning Agents
- Industrial

Uses - Worker

Title : Use in Cleaning Agents
- Professional

Uses - Worker

Title : Lubricants
- Industrial

Uses - Worker

Title : Metal working fluids / rolling oils
- Industrial

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Uses - Worker

Title : Metal working fluids / rolling oils
- Professional

Uses - Worker

Title : Functional Fluids
- Industrial

Uses - Worker

Title : Functional Fluids
- Professional

Uses - Worker

Title : De-icing and anti-icing applications
- Professional

Uses - Worker

Title : Use in laboratories
- Industrial

Uses - Worker

Title : Use in laboratories
- Professional

Uses - Worker

Title : Use as a fuel
- Professional

Uses - Worker

Title : Use in Oil and Gas field drilling and production operations
- Industrial

Identified Uses according to the Use Descriptor System

Uses - Consumer

Title : Uses in Coatings
- Consumer

Uses - Consumer

Title : Use in Cleaning Agents
- Consumer

Uses - Consumer

Title : De-icing and anti-icing applications

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- Consumer

Uses - Consumer

Title : Other Consumer Uses
- Consumer

Uses - Consumer

Title : Use as a fuel
- Consumer

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.

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000645 | |
| 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 4, PROC 8a, PROC 8b, PROC 15 Environmental Release Categories: ERC1, ERC4 |
| Scope of process | Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities. |

| | | |
|---|---|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)elevated temperatureContinuous processPROC1 | No specific measures identified. | |
| General exposures (closed systems)with occasional controlled exposure.elevated temperature-Continuous processPROC2 | Provide extraction ventilation at points where emissions occur. | |
| General exposures.Use in contained batch processesPROC3 | No specific measures identified. | |
| General exposures.Batch processPROC4 | No specific measures identified. | |
| Process samplingelevated temperaturePROC2 | Use a sampling system designed to control exposure. | |

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| | |
|---|--|
| Equipment cleaning and maintenancePROC8a | Drain down and flush system prior to equipment opening or maintenance. |
| Bulk transfersDedicated facilityPROC8b | Use in semi-automated and predominantly enclosed filling lines. |
| Bulk product storage(closed systems)PROC1 | No specific measures identified. |
| Laboratory activitiesPROC15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

| | |
|---|--|
| 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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|--|
| 300000000647 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as an intermediate- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU8, SU9 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 Environmental Release Categories: ERC6a |
| Scope of process | Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes 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 | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)Continuous processPROC1 | No specific measures identified. | |
| General exposures (closed systems)with occasional controlled exposure.Continuous processPROC2 | No specific measures identified. | |
| General exposures.Use in contained batch processesPROC3 | No specific measures identified. | |
| General exposures.Batch processPROC4 | No specific measures identified. | |
| Process samplingPROC2 | Ensure dedicated sample points are provided. | |
| Equipment cleaning and | Drain down and flush system prior to equipment opening or | |

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| | |
|--|---|
| maintenancePROC8a | maintenance. |
| Bulk transfersDedicated facilityPROC8b | No specific measures identified. |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. |
| Bulk product storage(closed systems)PROC1 | No specific measures identified. |
| Laboratory activitiesPROC15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

| | |
|---|--|
| 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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000646 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Distribution of substance- Industrial |
| Use Descriptor | Sector of Use: SU 3, SU8, SU9 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 Environmental Release Categories: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 |
| 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. |

| | | |
|---|---|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)Continuous processPROC1 | No specific measures identified. | |
| General exposures (closed systems)with occasional controlled exposure.Continuous processPROC2 | No specific measures identified. | |
| General exposures.Use in contained batch processesPROC3 | No specific measures identified. | |
| General exposures.Batch processPROC4 | No specific measures identified. | |
| Product sampling.PROC2 | Ensure dedicated sample points are provided. | |
| Equipment cleaning and | Drain down and flush system prior to equipment opening or | |

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| | |
|--|---|
| maintenancePROC8a | maintenance. |
| Bulk transfersDedicated facilityPROC8b | No specific measures identified. |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. |
| Drum/batch transfersDedicated facilityPROC8b | No specific measures identified. |
| Drum and small package fillingPROC9 | Fill containers/cans at dedicated filling points supplied with local extract ventilation. |
| Bulk product storage(closed systems)PROC1 | No specific measures identified. |
| Laboratory activitiesPROC15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

| | |
|---|--|
| 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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000648 | |
| 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: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 Environmental Release Categories: ERC2 |
| Scope of process | Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities. |

| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
|---|---|--|
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. | | |
| Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)Continuous processPROC1 | No specific measures identified. | |
| General exposures (closed systems)with occasional controlled exposure.Continuous processPROC2 | No specific measures identified. | |
| General exposures.Use in contained batch processesPROC3 | No specific measures identified. | |
| General exposures.Batch processPROC4 | No specific measures identified. | |
| Mixing operations (open systems)PROC5 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |

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|---|---|
| Production or preparation or articles by tableting, compression, extrusion or pelletisationPROC14 | No specific measures identified. |
| Product sampling.PROC9 | Ensure dedicated sample points are provided. |
| Equipment cleaning and maintenancePROC8a | Drain down and flush system prior to equipment opening or maintenance. |
| Bulk transfersDedicated facilityPROC8b | No specific measures identified. |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. |
| Drum/batch transfersDedicated facilityPROC8b | No specific measures identified. |
| Drum and small package fillingPROC9 | Fill containers/cans at dedicated filling points supplied with local extract ventilation. |
| Bulk product storage(closed systems)PROC1 | No specific measures identified. |
| Laboratory activitiesPROC15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

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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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|--|
| 300000000649 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Uses in Coatings- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15 Environmental Release Categories: ERC4 |
| Scope of process | Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities. |

| | | |
|--|---|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. | | |
| Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)PROC1 | No specific measures identified. | |
| General exposures (closed systems)with sample collectionPROC2 | No specific measures identified. | |
| Film formation - force drying, stoving and other technologies.PROC2 | No specific measures identified. | |
| Film formation - air dryingPROC2 | No specific measures identified. | |
| Mixing operations (closed systems)PROC3 | No specific measures identified. | |
| Mixing operations (open systems)Preparation of | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |

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| material for applica- tionPROC5 | |
| Material transfersDedicated facilityPROC8b | No specific measures identified. |
| Bulk transfersNon- dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. |
| Drum/batch transfer- sPROC8b | Use drum pumps or carefully pour from container. |
| Spraying (automat- ic/robotic)PROC7 | Carry out in a vented booth or extracted enclosure. Ensure the ventilation system is regularly maintained and tested. Wear chemically resistant gloves (tested to EN374) in combi- nation with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. |
| ManualSprayingPROC7 | Carry out in a vented booth or extracted enclosure. Ensure the ventilation system is regularly maintained and tested. Wear chemically resistant gloves (tested to EN374) in combi- nation with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. |
| Roller, spreader, flow appli- cationPROC10 | Use long handled brushes and rollers where possible. Wear chemically resistant gloves (tested to EN374) in combi- nation with 'basic' employee training. |
| Dipping, immersion and pouringPROC13 | Wear chemically resistant gloves (tested to EN374) in combi- nation with 'basic' employee training. |
| Laboratory activi- tiesPROC15 | No specific measures identified. |
| Equipment cleaning and maintenancePROC8a | Drain down system prior to equipment opening or mainte- nance. |
| Storage.PROC1 | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|--|----------------------------|
| 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 | |
| No exposure assessment presented for the environment. | |

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| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
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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

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

| | |
|-------------------------|--|
| 300000000650 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Uses in Coatings- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities. |

| | | |
|--|---|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. | | |
| Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | | Risk Management Measures |
| Filling/ preparation of equipment from drums or containers.PROC8b | | No specific measures identified. |
| General exposures (closed systems)Use in contained systemsPROC1 | | No specific measures identified. |
| Preparation of material for applicationPROC5 | | No specific measures identified. |
| Film formation - air dryingPROC2 | | No specific measures identified. |
| Film formation - force drying, stoving and other technologies.PROC2 | | No specific measures identified. |
| Material trans- | | Use drum pumps or carefully pour from container. |

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| fersDrum/batch trans- fersNon-dedicated facili- tyPROC8a | |
| Material trans- fersDrum/batch trans- fersDedicated facili- tyPROC8b | No specific measures identified. |
| Roller, spreader, flow appli- cationPROC10 | Provide extraction ventilation at points where emissions occur. Use long handled brushes and rollers where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| ManualSprayingPROC7 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Carry out in a vented booth or extracted enclosure. , or: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |
| Dipping, immersion and pouringPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Hand application - finger- paints, pastels, adhe- sivesPROC19 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Laboratory activi- tiesPROC15 | No specific measures identified. |
| Equipment cleaning and maintenancePROC8a | Drain down system prior to equipment opening or maintenance. |
| Storage.PROC1 | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |

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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 |
| No exposure assessment presented for the environment. |

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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. | |

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| Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. |
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| Section 4.2 -Environment |
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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

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|-------------------------|---|
| 300000000651 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in Cleaning Agents- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13 Environmental Release Categories: ERC4 |
| Scope of process | Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting Exposure | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | |
| Contributing Scenarios | Risk Management Measures |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. |
| Use in contained systemsAutomated process with (semi) closed systems.PROC1PROC2 | No specific measures identified. |
| Drum/batch transfersPROC3 | Use drum pumps or carefully pour from container. |
| Filling/ preparation of equipment from drums or containers.Dedicated facilityPROC8b | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Use in contained batch processesTreatment by | Provide extraction ventilation at points where emissions occur. |

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| | |
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| heatingPROC3PROC4 | |
| Degreasing small objects in cleaning stationPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Cleaning with low-pressure washersPROC10 | Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Cleaning with high pressure washersPROC7 | Carry out in a vented booth or extracted enclosure. Ensure the ventilation system is regularly maintained and tested. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. |
| ManualCleaningSurfacesno sprayingPROC10 | Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Section 2.2 | Control of Environmental Exposure |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

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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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000652 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in Cleaning Agents- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand). |

| | |
|---|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting Exposure | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | |

| | |
|--|---|
| Contributing Scenarios | Risk Management Measures |
| Filling/ preparation of equipment from drums or containers.Dedicated facilityPROC8b | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Use in contained systemsAutomated process with (semi) closed systems.PROC1PROC2 | No specific measures identified. |
| Drum/batch transfersPROC8b | Use drum pumps or carefully pour from container. |
| Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)PROC4 | No specific measures identified. |
| Filling/ preparation of equipment from drums or containers.Non-dedicated facilityPROC8a | Use drum pumps or carefully pour from container. |
| ManualCleaningSurfacesDipping, immersion and pouringPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

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| Cleaning with low-pressure washer-sPROC10 | Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Cleaning with high pressure washer-sPROC11 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Carry out in a vented booth or extracted enclosure. , or: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |
| ManualCleaningSurfacesSprayingPROC11 | Provide extraction ventilation at points where emissions occur. Use long handled brushes and rollers where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Ad hoc manual application via trigger sprays, dipping, etc.Rolling, Brush-ingPROC10 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Application of cleaning products in closed systemsPROC3PROC4 | No specific measures identified. |
| Cleaning of medical devicesPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

Section 2.2

Control of Environmental Exposure

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

No exposure assessment presented for the environment.

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

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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

| | |
|-------------------------|--|
| 300000000653 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Lubricants- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18 Environmental Release Categories: ERC4, ERC7 |
| Scope of process | Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes. |

| | | |
|---|---|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | Risk Management Measures | |
| General exposures (closed systems)PROC1PROC3 | No specific measures identified. | |
| General exposures (open systems)PROC2PROC4 | Wear suitable gloves tested to EN374. | |
| Bulk transfersDedicated facilityPROC8b | No specific measures identified. | |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. | |
| Filling/ preparation of equipment from drums or containers.PROC8b | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| Initial factory fill of equipmentPROC9 | Use in semi-automated and predominantly enclosed filling lines. | |
| Operation and lubrication of | Minimise exposure by partial enclosure of the operation or | |

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| high energy open equipment with potential for aerosol generation. PROC17 PROC18 | equipment and provide extract ventilation at openings. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Manual applications e.g. brushing, rolling PROC10 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use long handled brushes and rollers where possible. |
| Treatment by dipping and pouring PROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Spraying PROC7 | Carry out in a vented booth or extracted enclosure. Ensure the ventilation system is regularly maintained and tested. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. |
| Maintenance (of larger plant items) and machine set up- PROC8b | No specific measures identified. |
| Engine lubricant service- PROC9 | Handle substance within a closed system. |
| Maintenance of small items PROC8a | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Remanufacture of reject articles PROC9 | Provide extraction ventilation at points where emissions occur. |
| Storage. PROC1 | No specific measures identified. |

Section 2.2

Control of Environmental Exposure

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

No exposure assessment presented for the environment.

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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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000654 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Metal working fluids / rolling oils- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17 Environmental Release Categories: ERC4 |
| Scope of process | Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils. |

| | | |
|---|---|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | | Risk Management Measures |
| General exposures (closed systems)PROC1PROC3 | | No specific measures identified. |
| General exposures (open systems)PROC2PROC4 | | Wear suitable gloves tested to EN374. |
| Bulk transfersDedicated facilityPROC8b | | No specific measures identified. |
| Bulk transfersNon-dedicated facilityPROC8a | | Ensure material transfers are under containment or extract ventilation. |
| Filling/ preparation of equipment from drums or containers.PROC5PROC8bPROC9 | | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Product sampling.PROC9 | | Use dedicated equipment. Wear suitable gloves tested to EN374. |

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| Metal machining operationsPROC17 | Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Treatment by dipping and pouringPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| SprayingPROC7 | Carry out in a vented booth or extracted enclosure. Ensure the ventilation system is regularly maintained and tested. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. |
| ManualRoller, spreader, flow applicationPROC10 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use long handled brushes and rollers where possible. |
| Automated metal rolling/formingPROC2 | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. |
| Semi-automated metal rolling/formingPROC17 | Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Equipment cleaning and maintenancePROC8a | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Storage.PROC1 | Store substance within a closed system. |

Section 2.2

Control of Environmental Exposure

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

No exposure assessment presented for the environment.

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

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| should ensure that risks are managed to at least equivalent levels. |
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| Section 4.2 -Environment |
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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000655 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Metal working fluids / rolling oils- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Covers the use in formulated MWFs including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | | Risk Management Measures |
| General exposures (closed systems)PROC1PROC3 | | No specific measures identified. |
| Bulk transfersDedicated facilityPROC8b | | No specific measures identified. |
| Bulk transfersNon-dedicated facilityPROC8a | | Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Filling/ preparation of equipment from drums or containers.Dedicated facilityPROC5PROC8bPROC9 | | No specific measures identified. |
| Filling/ preparation of equipment from drums or contain- | | Ensure material transfers are under containment or extract ventilation. |

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| ers.Non-dedicated facilityPROC8a | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Product sampling.PROC8bPROC9 | Use dedicated equipment. Wear suitable gloves tested to EN374. |
| Metal machining operationsPROC17 | Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Manual applications e.g. brushing, rollingPROC10 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use long handled brushes and rollers where possible. |
| Treatment by dipping and pouringPROC13 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| SprayingPROC11 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Carry out in a vented booth or extracted enclosure. , or: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |
| Equipment cleaning and maintenanceDedicated facilityPROC8b | No specific measures identified. |
| Equipment cleaning and maintenanceNon-dedicated facilityPROC8a | Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Storage.PROC1 | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |

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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 | |
| No exposure assessment presented for the environment. | |

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|-----------------------------|--|
| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |

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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

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000656 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Functional Fluids- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 Environmental Release Categories: ERC7 |
| Scope of process | Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | Risk Management Measures | |
| Bulk transfersDedicated facilityPROC8b | No specific measures identified. | |
| Bulk transfersNon-dedicated facilityPROC8a | Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| Filling of articles/equipmentPROC9 | Fill containers/cans at dedicated filling points supplied with local extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| Filling/ preparation of equipment from drums or containers.PROC8b | Use dedicated equipment. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| General exposures.(closed systems)PROC1PROC3 | No specific measures identified. | |

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| General exposures.(open systems)PROC2PROC4 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Equipment maintenance-PROC8a | Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374. |
| Remanufacture of reject articlesPROC9 | Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374. |
| Storage.PROC1 | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |

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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 |
| No exposure assessment presented for the environment. |

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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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

| | |
|-------------------------|---|
| 300000000657 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Functional Fluids- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC20 Environmental Release Categories: ERC9a, ERC9b |
| Scope of process | Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers. |

| | | |
|---|---|--------------------------|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | | Risk Management Measures |
| Drum/batch transfersPROC8a | Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| Transfer from/pouring from containersPROC9 | Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| Filling/ preparation of equipment from drums or containers.PROC9PROC20 | Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | |
| General exposures.(closed systems)PROC1PROC2PROC3 | No specific measures identified. | |
| Remanufacture of reject articlesPROC9 | Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374. | |

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| Equipment maintenance- PROC8a | Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374. |
| Storage.PROC1 | Store substance within a closed system. |
| Drum/batch transfersDedicated facilityPROC8b | No specific measures identified. |

Section 2.2

Control of Environmental Exposure

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

No exposure assessment presented for the environment.

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

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

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|-------------------------|--|
| 300000000658 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | De-icing and anti-icing applications- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC8a, PROC8b, PROC11 Environmental Release Categories: ERC8d |
| Scope of process | Ice prevention and de-icing of vehicles, aircraft and other equipment by spraying. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting Exposure | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | |
| Contributing Scenarios | Risk Management Measures |
| Bulk open unloading.PROC8a | Use dedicated equipment. , or: Ensure material transfers are under containment or extract ventilation. |
| Filling/ preparation of equipment from drums or containers.PROC8b | Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| General exposures.(closed systems)PROC1PROC2 | No specific measures identified. |
| Material transferselevated temperaturePROC8a | Use dedicated equipment. , or: Ensure material transfers are under containment or extract ventilation. |
| Spraying/ fogging by machine applicationelevated temperaturePROC11 | Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20. |

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| Spraying/ fogging by manual application PROC11 | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Carry out in a vented booth or extracted enclosure. , or: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |
| Equipment maintenance- PROC8a | Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374. |
| Section 2.2 | Control of Environmental Exposure |

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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 |
| No exposure assessment presented for the environment. |

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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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Worker

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|-------------------------|---|
| 300000000659 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in laboratories- Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC 15 Environmental Release Categories: ERC2, ERC4 |
| Scope of process | Use of the substance within laboratory settings, including material transfers and equipment cleaning. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%, Unless stated otherwise., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting Exposure | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | |
| Contributing Scenarios | Risk Management Measures |
| Laboratory activities small scale PROC 15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

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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 | |
| No exposure assessment presented for the environment. | |

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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 | |

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| should ensure that risks are managed to at least equivalent levels. |
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| Section 4.2 -Environment |
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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

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|-------------------------|--|
| 300000000660 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in laboratories- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC15 Environmental Release Categories: ERC8a |
| Scope of process | Use of small quantities within laboratory settings, including material transfers and equipment cleaning. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%. Unless stated otherwise., |
| Frequency and Duration of Use | |
| Covers daily exposures up to 8 hours (unless stated differently). | |
| Other Operational Conditions affecting Exposure | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | |
| Contributing Scenarios | Risk Management Measures |
| Laboratory activities small scale PROC15 | No specific measures identified. |
| Section 2.2 | Control of Environmental Exposure |

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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 | |
| No exposure assessment presented for the environment. | |

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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 | |

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| should ensure that risks are managed to at least equivalent levels. |
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| Section 4.2 -Environment |
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| No exposure assessment presented for the environment. |
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Exposure Scenario - Worker

| | |
|-------------------------|--|
| 300000010118 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as a fuel- Professional |
| Use Descriptor | Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 Environmental Release Categories: ERC9a, ERC9b |
| Scope of process | Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste. |

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| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., |
| 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 |

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|---|---|
| Bulk transfersPROC8b | Handle substance within a closed system. Clear transfer lines prior to de-coupling. Wear suitable gloves tested to EN374. Avoid carrying out operation for more than 4 hours. |
| Drum/batch transfersPROC8b | Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374. |
| Refueling.PROC8b | Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374. |
| General exposures (closed systems)PROC1PROC2PROC3PROC16 | No other specific measures identified. |
| Equipment cleaning and maintenance-PROC8a | Drain down and flush system prior to equipment opening or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the |

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| | skin. |
| Storage.PROC1 | Store substance within a closed system. |

Section 2.2

Control of Environmental Exposure

No exposure assessment presented for the environment.

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

No exposure assessment presented for the environment.

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

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

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|-------------------------|--|
| 300000010777 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in Oil and Gas field drilling and production operations-Industrial |
| Use Descriptor | Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b Environmental Release Categories: ERC4 |
| Scope of process | Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. |

| | | |
|---|---|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| 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 percentage substance in the product up to 100%., Unless stated otherwise., | |
| Frequency and Duration of Use | | |
| Covers daily exposures up to 8 hours (unless stated differently). | | |
| Other Operational Conditions affecting Exposure | | |
| Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently). | | |
| Contributing Scenarios | | Risk Management Measures |
| Bulk transfers from tote tanks and supply vesselsPROC8b | | No specific measures identified. |
| Filling/ preparation of equipment from drums or containers.PROC8b | | |
| Drilling mud (re-)formulationPROC3 | | Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Drill floor operationsPROC4 | | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Operation of solids filtering equipmentelevated temperaturePROC4 | | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. |

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| Cleaning of solids filtering equipmentPROC8a | Wear suitable gloves tested to EN374. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Treatment and disposal of filtered solidsPROC3 | Wear suitable gloves tested to EN374. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Process samplingPROC3 | Wear suitable gloves tested to EN374. |
| General exposures (closed systems)PROC1 | No specific measures identified. |
| Pouring from small containersPROC8a | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| General exposures (open systems)PROC4 | Wear suitable gloves tested to EN374. |
| Equipment cleaning and maintenancePROC8a | Drain down system prior to equipment opening or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| General process exposures from enclosed processesPROC2 | Store substance within a closed system. |
| Section 2.2 | Control of Environmental Exposure |
| No exposure assessment presented for the environment. | |

| | |
|---|----------------------------|
| 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 |
| No exposure assessment presented for the environment. |

| | |
|---|--|
| 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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Consumer

| | |
|-------------------------|---|
| 300000001088 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Uses in Coatings - Consumer |
| Use Descriptor | Sector of Use: SU 21 Product Categories: PC1, PC9a, PC15, PC18, PC23, PC31, PC32, PC34 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning. |

| | | |
|---|---|-------|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| Section 2.1 | Control of Consumer Exposure | |
| Product Characteristics | | |
| Physical form of product | Liquid, vapour pressure > 10 Pa at STP | |
| Concentration of the Substance in Mixture/Article | Covers concentration up to (%): 5 % | |
| Amounts Used | | |
| for each use event, covers amount up to (g): | | 9.000 |
| Frequency and Duration of Use | | |
| Covers use up to (days/year): | | 365 |
| covers use up to (times/day of use): | | 1 |
| Exposure (hours/event): | | 10 |
| Product Categories | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Adhesives, sealants Glues DIY-use (carpet glue, tile glue, wood parquet glue). | Covers concentrations up to 0,1 % | |
| | For each use event, covers amount up to 9.000 g | |
| | covers use up to 0,25 day/year | |
| | Covers use up to 1 times/day of use | |
| | Covers exposure up to 1,25 hours/event | |
| | covers skin contact area up to (cm2): 110 cm2 | |
| | Covers use in room size of 58 m3 | |
| | Covers use under typical household ventilation. | |
| | Covers use at ambient temperatures. | |
| Coatings and paints, thinners, paint removers Waterborne latex wall paint. | Covers concentrations up to 10 % | |
| | For each use event, covers amount up to 1.250 g | |
| | covers use up to 1 day/year | |

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| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Coatings and paints, thinners, paint removers Solvent rich, high solid, water borne paint. | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Coatings and paints, thinners, paint removers Aerosol spray can. | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 300 g |
| | covers use up to 2 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 0,25 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in a one car garage (34 m3) under typical ventilation. |
| | Covers use at ambient temperatures. |
| Coatings and paints, thinners, paint removers Removers (paint-, glue-, wall paper-, sealant-remover). | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Non-metal-surface treatment products Waterborne latex wall paint. | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |

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| | Covers use at ambient temperatures. |
| Non-metal-surface treatment products Solvent rich, high solid, water borne paint. | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Non-metal-surface treatment products Aerosol spray can. | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 300 g |
| | covers use up to 2 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 0,25 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in a one car garage (34 m3) under typical ventilation. |
| | Covers use at ambient temperatures. |
| Non-metal-surface treatment products Removers (paint-, glue-, wall paper-, sealant-remover). | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Ink and toners | Covers concentrations up to 5 % |
| | For each use event, covers amount up to 50 g |
| | covers use up to 365 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 10 hours/event |
| | covers skin contact area up to (cm2): 215 cm2 |
| | Covers use in room size of 25 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Leather tanning, dye, finishing, impregnation and care products Polishes, wax / cream (floor, furniture, shoes). | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |

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| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Polishes and wax blends Polishes, wax / cream (floor, furniture, shoes). | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 550 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 4 hours/event |
| | covers skin contact area up to (cm2): 430 cm2 |
| | Covers use in room size of 58 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Polymer preparations and compounds | Covers concentrations up to 5 % |
| | For each use event, covers amount up to 825 g |
| | covers use up to 0,2 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 0,5 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 58 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |
| Textile dyes, finishing and impregnating products; including bleaches and other processing aids | Covers concentrations up to 10 % |
| | For each use event, covers amount up to 1.250 g |
| | covers use up to 1 day/year |
| | Covers use up to 1 times/day of use |
| | Covers exposure up to 2,2 hours/event |
| | covers skin contact area up to (cm2): 1.900 cm2 |
| | Covers use in room size of 20 m3 |
| | Covers use under typical household ventilation. |
| | Covers use at ambient temperatures. |

Section 2.2

Control of Environmental Exposure

SECTION 3

EXPOSURE ESTIMATION

Section 3.1 - Health

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

Section 3.2 -Environment

No exposure assessment presented for the environment.

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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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Consumer

| | |
|-------------------------|---|
| 300000001090 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use in Cleaning Agents - Consumer |
| Use Descriptor | Sector of Use: SU 21 Product Categories: PC3, PC35 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products. |

| | | |
|--|---|-----|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| Section 2.1 | Control of Consumer Exposure | |
| Product Characteristics | | |
| Physical form of product | Liquid, vapour pressure > 10 Pa at STP | |
| Frequency and Duration of Use | | |
| Unless stated otherwise. | | |
| Covers use up to (days/year): | | 365 |
| Unless otherwise stated. | | |
| covers use up to (times/day of use): | | 4 |
| Covers exposure up to (hours/event): | | 8 |
| Other Operational Conditions affecting Exposure | | |
| Unless stated otherwise. | | |
| Covers use at ambient temperatures. | | |
| Covers use in room size of 20m3 | | |
| Covers use under typical household ventilation. | | |
| Product Categories | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Air care products Air care, instant action (aerosol sprays). | Unless stated otherwise. Covers concentrations up to 1 % | |
| | covers use up to 365 day/year | |
| | Covers use up to 4 times/day of use | |
| | For each use event, covers amount up to 0,1 g | |
| | Covers use under typical household ventilation. | |
| | Covers use in room size of 20m3 | |
| | for each use event Covers exposure up to 0,25 hours/event | |
| Air care products Air care. | Unless stated otherwise. Covers concentrations up to 1 % | |

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| continuous action (solid and liquid). | |
| | covers use up to 364 day/year |
| | covers use up to 1 times/day of use |
| | covers skin contact area up to (cm2): 35,70 cm2 |
| | For each use event, covers amount up to 0,48 g |
| | Covers use under typical household ventilation. |
| | Covers use in room size of 20m3 |
| | for each use event Covers exposure up to 8,00 hours/event |
| Washing and cleaning products (including solvent based products) Laundry and dish washing products. | Unless stated otherwise. Covers concentrations up to 5 % |
| | covers use up to 364 day/year |
| | Covers use up to 1 times/day of use |
| | covers skin contact area up to (cm2): 857,50 |
| | For each use event, covers amount up to 15 g |
| | Covers use under typical household ventilation. |
| | Covers use in room size of 20m3 |
| | for each use event Covers exposure up to 0,5 hours/event |
| Washing and cleaning products (including solvent based products) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners). | Unless stated otherwise. Covers concentrations up to 20 % |
| | covers use up to 364 day/year |
| | Covers use up to 1 times/day of use |
| | covers skin contact area up to (cm2): 857,50 cm2 |
| | for each use event, covers amount up to (g): 27 g |
| | Covers use under typical household ventilation. |
| | Covers use in room size of 20m3 |
| | for each use event Covers exposure up to 0,33 hours/event |
| Washing and cleaning products (including solvent based products) Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners). | Unless stated otherwise. Covers concentrations up to 15 % |
| | covers use up to 364 day/year |
| | Covers use up to 1 times/day of use |
| | covers skin contact area up to (cm2): 428,00 cm2 |
| | For each use event, covers amount up to 35 g |
| | Covers use under typical household ventilation. |
| | Covers use in room size of 20m3 |
| | for each use event Covers exposure up to 0,17 hours/event |

Section 2.2

Control of Environmental Exposure

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| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| EGRET Consumer Tool V2 | |

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|---|
| Section 3.2 -Environment |
| No exposure assessment presented for the environment. |

| | |
|---|--|
| 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 |
| No exposure assessment presented for the environment. |

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Exposure Scenario - Consumer

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| 300000001092 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | De-icing and anti-icing applications - Consumer |
| Use Descriptor | Sector of Use: SU 21 Product Categories: PC4 Environmental Release Categories: ERC8d |
| Scope of process | De-icing of vehicles and similar equipment by spraying. |

| | | |
|---|---|-------|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Additional Information | No exposure assessment presented for the environment. | |
| Section 2.1 | Control of Consumer Exposure | |
| Product Characteristics | | |
| Physical form of product | Liquid, vapour pressure > 10 Pa at STP | |
| Concentration of the Sub-stance in Mixture/Article | Covers concentration up to (%): 100 % | |
| Amounts Used | | |
| for each use event, covers amount up to (g): | | 5.000 |
| Frequency and Duration of Use | | |
| Covers use up to (days/year): | | 365 |
| Exposure (hours/event): | | 4 |
| Product Categories | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES | |
| Anti-Freeze and de-icing products Washing car win- dow. | Covers concentrations up to 100 % | |
| | For each use event, covers amount up to 33 g | |
| | covers use up to 365 day/year | |
| | Covers use up to 1 times/day of use | |
| | Covers exposure up to 4 hours/event | |
| | covers skin contact area up to (cm2): 215 cm2 | |
| | Covers use in room size of 58 m3 | |
| | Covers use under typical household ventilation. | |
| | Covers use at ambient temperatures. | |
| Anti-Freeze and de-icing products Pouring into radia- tor. | Covers concentrations up to 45 % | |
| | For each use event, covers amount up to 5.000 g | |
| | covers use up to 1 day/year | |
| | Covers use up to 1 times/day of use | |
| | Covers exposure up to 0,25 hours/event | |
| | covers skin contact area up to (cm2): 960 cm2 | |
| | Covers use in a one car garage (34 m3) under typical ventila- | |

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| | tion. |
| | Covers use at ambient temperatures. |

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| Section 2.2 | Control of Environmental Exposure |
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|--|----------------------------|
| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. | |

| | |
|---|--|
| Section 3.2 -Environment | |
| No exposure assessment presented for the environment. | |

| | |
|---|--|
| 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 | |
| No exposure assessment presented for the environment. | |

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Exposure Scenario - Consumer

| | |
|-------------------------|---|
| 300000001093 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Other Consumer Uses - Consumer |
| Use Descriptor | Sector of Use: SU 21 Product Categories: PC28, PC39 Environmental Release Categories: ERC8a, ERC8d |
| Scope of process | Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation. |

| | |
|--------------------------------|---|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for human health. No exposure assessment presented for the environment. |
| Section 2.1 | Control of Consumer Exposure |
| Product Characteristics | |
| Product Categories | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |

| | |
|--------------------|--|
| Section 2.2 | Control of Environmental Exposure |
|--------------------|--|

| | |
|--|----------------------------|
| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| No exposure assessment presented for human health. | |

| | |
|---|--|
| Section 3.2 -Environment | |
| No exposure assessment presented for the environment. | |

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| SECTION 4 | GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO |
| Section 4.1 - Health | |
| No exposure assessment presented for human health. | |

| | |
|---|--|
| Section 4.2 -Environment | |
| No exposure assessment presented for the environment. | |

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Exposure Scenario - Consumer

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|-------------------------|---|
| 300000010119 | |
| SECTION 1 | EXPOSURE SCENARIO TITLE |
| Title | Use as a fuel - Consumer |
| Use Descriptor | Sector of Use: SU 21 Product Categories: PC13 Environmental Release Categories: ERC9a, ERC9b |
| Scope of process | Covers consumer uses in liquid fuels. |

| | |
|--|--|
| SECTION 2 | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Additional Information | No exposure assessment presented for the environment. |
| Section 2.1 | Control of Consumer Exposure |
| Product Characteristics | |
| Physical form of product | Liquid, vapour pressure > 10 Pa at STP |
| Concentration of the Sub-stance in Mixture/Article | Covers concentration up to (%): 100 % |
| Amounts Used | |
| for each use event, covers amount up to (g): | 220 |
| Frequency and Duration of Use | |
| Covers use up to (days/year): | 52 |
| Covers exposure up to (hours/event): | 5 |
| Product Categories | OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES |
| Fuels Liquid: Lamp oil. | Covers use under typical household ventilation. |
| | Covers concentrations up to 100 % |
| | covers use up to 52 day/year |
| | Covers use up to 1 times/day of use |
| | covers skin contact area up to (cm2): 210 cm2 |
| | For each use event, covers amount up to 220 g |
| | Covers use in room size of 20m3 |
| | for each use event Covers exposure up to 5 hours/event |

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| Section 2.2 | Control of Environmental Exposure |
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| SECTION 3 | EXPOSURE ESTIMATION |
| Section 3.1 - Health | |
| The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. | |

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| Section 3.2 -Environment | |
| No exposure assessment presented for the environment. | |

SAFETY DATA SHEET

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

Diethylene Glycol

Version
3.4

Revision Date:
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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 | |
| No exposure assessment presented for the environment. | |