

SAFETY DATA SHEET

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

Ethylene Glycol Industrial Grade

Version	Revision Date:	SDS Number:	Date of last issue: 28.03.2023
3.2	30.07.2024	800001001028	Print Date 06.08.2024

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

1.1 Product identifier

Trade name	: Ethylene Glycol Industrial Grade
Product code	: U1284
Registration number EU	: 01-2119456816-28-0001, 01-2119456816-28-0002
Synonyms	: Dihydroxy ethane 1,2, Ethane diol 1,2, Ethylene Glycol, Glycol, MEG

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.

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)
(In non-emergency situations, the number of the Poison Information Centre is 08-33 12 31)

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.
Specific target organ toxicity - repeated	H373: May cause damage to organs through pro-

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exposure, Category 2, Kidney

longed or repeated exposure.

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.

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

ENVIRONMENTAL HAZARDS:

Not classified as environmental hazard according to CLP criteria.

Precautionary statements

:

Prevention:

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

P264 Wash hands 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.

P314 Get medical advice/ attention if you feel unwell.

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.

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

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Slightly irritating to respiratory system.
Slightly irritating to the skin.
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)
ethanediol	107-21-1 203-473-3	99 - 100
Diethylene glycol	111-46-6 203-872-2	0 - < 1

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	: Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
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 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	: Kidney toxicity may be recognized by blood in the urine or
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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.

Not considered to be an inhalation hazard under normal conditions of use.

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.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Call a doctor or poison control center for guidance.
Treat symptomatically.
May cause significant renal, respiratory, and CNS toxicity.
May cause significant acidosis.
The preferred treatment is immediate transportation to a medical facility and use of appropriate treatment including possible administration of activated charcoal, gastric lavage and or gastric aspiration. If none of the above are immediately available and a delay of more than one hour is anticipated before such medical attention can be obtained, induction of vomiting may be appropriate using IPECAC syrup (Contraindicated if there are any signs of CNS depression). This should be considered on a case by case basis following specialist advice. Specific other treatments may include ethanol therapy, fomepizole, treatment of acidosis and haemodialysis. Seek specialist advice without delay.

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

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as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely

6.4 Reference to other sections

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- | | |
|-------------------------|---|
| Technical measures | : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Ensure that all local regulations regarding handling and storage facilities are followed. |
| 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	NGV	10 ppm 25 mg/m ³	AFS 2023:14
	Further information: Substance can be easily absorbed through the skin.			
ethanediol		KGV	40 ppm 104 mg/m ³	AFS 2023:14
	Further information: Substance can be easily absorbed through the 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			
Diethylene glycol	111-46-6	KGV	20 ppm 90 mg/m ³	AFS 2023:14
	Further information: Indicative short term limit value shall be used as a recommended maximum value and should not be exceeded, Substance can be easily absorbed through the skin.			
Diethylene glycol		NGV	10 ppm 45 mg/m ³	AFS 2023:14
	Further information: Substance can be easily absorbed through the skin.			

Biological occupational exposure limits

No biological limit allocated.

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

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Substance name	End Use	Exposure routes	Potential health effects	Value
ethanediol	Workers	Dermal	Long-term systemic effects	106 mg/kg/day
ethanediol	Workers	Inhalation	Long-term local effects	35 mg/m3
ethanediol	Consumers	Dermal	Long-term systemic effects	53 mg/kg/day
ethanediol	Consumers	Inhalation	Long-term local effects	7 mg/m3

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

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

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. 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.

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.

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,

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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 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].

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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

Odour Threshold : 25 ppm

Melting / freezing point : -13 °C

Boiling point/boiling range : 196 - 200 °C

Flammability

Flammability (solid, gas) : Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit /
upper flammability limit : 28 %(V)

Lower explosion limit /
Lower flammability limit : 3,2 %(V)

Flash point : 116 °C

Auto-ignition temperature : 398 °C

Decomposition temperature

Decomposition temperature : Data not available

pH : Data not available

Viscosity

Viscosity, dynamic : 16,1 mPa.s (25 °C)
Method: ASTM D445

Viscosity, kinematic : 24,8 mm²/s (20 °C)
Method: ASTM D445

Solubility(ies)

Water solubility : completely soluble

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Partition coefficient: n-octanol/water	:	log Pow: -1,93 (20 °C) Data not available
Vapour pressure	:	< 10 Pa (20 °C)
Relative density	:	1,1155 (20 °C) Method: ASTM D4052
Density	:	Typical 1.113 kg/m ³ (20 °C) Method: ASTM D4052
Relative vapour density	:	2,2
Particle characteristics Particle size	:	Data not available

9.2 Other information

Explosive properties	:	Not applicable
Oxidizing properties	:	Not applicable
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	:	62 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.
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10.4 Conditions to avoid

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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 organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11: Toxicological information

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

Information on likely routes of exposure : Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.

Acute toxicity

Components:

ethanediol:

Acute oral toxicity	: LD 50 (Rat, male and female): > 2.000 mg/kg Method: Acceptable non-standard method. 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, male and female): > 2,5 mg/l Exposure time: 6 h Test atmosphere: Aerosol Method: Literature data Remarks: LC50 > 1.0 - <= 5.0 mg/l LC50 greater than near-saturated vapour concentration. Based on available data, the classification criteria are not met.
Acute dermal toxicity	: LD 50 (Mouse, male and female): > 2.000 mg/kg Method: Literature data Remarks: Based on available data, the classification criteria are not met.

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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): > 1 -<= 5 mg/l
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): > 2.000 mg/kg
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Components:

ethanediol:

- Species : Rabbit
Method : Acceptable non-standard method.
Remarks : Slightly irritating to skin.
Insufficient to classify.

Diethylene glycol:

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

Serious eye damage/eye irritation

Components:

ethanediol:

- Species : Rabbit
Method : Acceptable non-standard method.
Remarks : Slightly irritating to the eye.
Insufficient to classify.

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:

ethanediol:

Species	:	Guinea pig
Method	:	Literature data
Remarks	:	Based on available data, the classification criteria are not met.

Diethylene glycol:

Species	:	Guinea pig
Method	:	Tested according to Annex V of Directive 67/548/EEC.
Remarks	:	Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Components:

ethanediol:

Genotoxicity in vitro	:	Method: OECD Test Guideline 471 Remarks: Based on data from similar materials Method: Acceptable non-standard method. Remarks: Based on data from similar materials Method: Literature data Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Species: Rat Method: Literature data 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.

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 479 Remarks: Based on available data, the classification criteria
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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:

ethanediol:

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

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

Diethylene glycol:

Species : Rat, male and female
Application Route : Oral
Method : Literature data
Remarks : Based on available data, the classification criteria are not met.
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
ethanediol	No carcinogenicity classification.
Diethylene glycol	No carcinogenicity classification.

Reproductive toxicity

Components:

ethanediol:

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

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Method: Literature data

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.

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:

ethanediol:

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

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:

ethanediol:

Exposure routes : Oral
Target Organs : Kidney
Remarks : May cause damage to organs or organ systems through prolonged or repeated exposure.

Diethylene glycol:

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

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Repeated dose toxicity

Components:

ethanediol:

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

Diethylene glycol:

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

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

Aspiration toxicity

Components:

ethanediol:

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

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.
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Further information

Product:

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

ethanediol:

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

Diethylene glycol:

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

SECTION 12: Ecological information

12.1 Toxicity

Components:

ethanediol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 72.860 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): 6.500 - 13.000 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to microorganisms : EC20 (Activated sludge, domestic waste): > 1.995 mg/l
Exposure time: 0,5 h
Method: Other guideline method.
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC: 15.380 mg/l
Exposure time: 7 d
Species: Pimephales promelas (fathead minnow)
Method: Other guideline method.
Remarks: NOEC/NOEL > 100 mg/l

Toxicity to daphnia and other aquatic invertebrates (Chronic) : NOEC: 8.590 mg/l
Exposure time: 7 d

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ic toxicity)

Species: Chironomus sp. (midge)
Method: Other guideline method.
Remarks: NOEC/NOEL > 100 mg/l

Diethylene glycol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h
Method: Literature data.
Remarks: Practically non toxic:
LL/EL/IL50 > 100 mg/l

Method: Other guideline method.

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: OECD Test 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:

ethanediol:

Biodegradability : Biodegradation: 90 - 100 %
Exposure time: 10 d

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Method: OECD Test Guideline 301A
Remarks: Readily biodegradable.

Diethylene glycol:

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

12.3 Bioaccumulative potential

Components:

ethanediol:

Bioaccumulation : Remarks: Does not have the potential to bioaccumulate significantly.

Diethylene glycol:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

12.4 Mobility in soil

Components:

ethanediol:

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

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:

ethanediol:

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

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..

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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:

ethanediol:

Additional ecological information : Does not have ozone depletion potential.

Diethylene glycol:

Additional ecological information : Data not available

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.

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Disposal, transport, storage and handling should be in accordance with SE regulation Avfallsförordning (2011:927).

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.

Packing: Emptying: Place the package upside down, and tilt slightly, circa 10 degrees, to enable drainage in such a way that the lowest part of the package is at the exit orifice. On some packing an extra hole must be made. Drainage should be carried out at room temperature (at least 15 °C). Wait until the package is drip dry. Do not close package after draining. Please note the risks connected with emptying package and containers with flammable liquids. Emptied package should be ventilated in a safe place away from sparks and fire. Residues may be an explosion risk. Do not puncture, cut or weld in non-cleaned package, containers or drums.

Local legislation
Remarks : Suggestion for emptied package:
15 01 02: Plastic packaging
15 01 04 metallic packaging.
Packages containing any remaining product and which have not been emptied until drip dry, must be handled as dangerous waste and must be well sealed before disposal.
Suggestion for waste code:
15 01 10: Packaging containing residues of or contaminated by dangerous substances

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 : Ethylene 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 - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, : Not applicable

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mixtures and articles (Annex XVII)

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

Other regulations:

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

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
AFS 2023:14	: Sweden. Occupational Exposure Limit Values, AFS 2023:14
2000/39/EC / TWA	: Limit Value - eight hours
2000/39/EC / STEL	: Short term exposure limit
AFS 2023:14 / NGV	: Time Weighted Average
AFS 2023:14 / KGV	: Short Term Exposure Limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by

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

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Classification of the mixture:

Acute Tox. 4

H302

STOT RE 2

H373

Classification procedure:

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence 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

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Uses - Worker

Title : Use in de-icing and anti-icing fluids
- Professional

Uses - Worker

Title : Use in functional fluids
- Professional

Uses - Worker

Title : Use in functional fluids
- Industrial

Uses - Worker

Title : Use in Agrochemicals uses
- Professional

Uses - Worker

Title : Metal working fluids / rolling oils
- Professional

Uses - Worker

Title : Metal working fluids / rolling oils
- Industrial

Uses - Worker

Title : Water treatment chemicals
- Industrial

Uses - Worker

Title : Use in laboratories
- Professional

Uses - Worker

Title : Use in laboratories
- Industrial

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

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- Consumer

Uses - Consumer

Title : Use in Cleaning Agents
- Consumer

Uses - Consumer

Title : Use in de-icing and anti-icing fluids
- Consumer

Uses - Consumer

Title : Other Consumer Uses
- 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

300000000671	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Manufacture of substance- Industrial
Use Descriptor	Sector of Use: SU3, 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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 process	No specific measures identified.	
General exposures (closed systems)General measures (skin irritants).elevated temperatureContinuous process	Provide extraction ventilation at points where emissions occur.	
General exposures.Use in contained batch processes	No specific measures identified.	
General exposures.Batch process	No specific measures identified.	
Process samplingelevated temperature	Use a sampling system designed to control exposure.	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.	

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Bulk transfersDedicated facility	Use in semi-automated and predominantly enclosed filling lines.
Bulk product storage(closed systems)	No specific measures identified.
Laboratory activities	No specific measures identified.
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

300000000673	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use as an intermediate- Industrial
Use Descriptor	Sector of Use: SU3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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 process	No specific measures identified.	
General exposures (closed systems)General measures (skin irritants).Continuous process	No specific measures identified.	
General exposures.Use in contained batch processes	No specific measures identified.	
General exposures.Batch process	No specific measures identified.	
Process sampling	Ensure dedicated sample points are provided.	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.	

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Bulk transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.
Bulk product storage(closed systems)	No specific measures identified.
Laboratory activities	No specific measures identified.
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

300000000672	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Distribution of substance- Industrial
Use Descriptor	Sector of Use: SU3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15 Environmental Release Categories: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC 6C, ERC 6D, 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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 process	No specific measures identified.	
General exposures (closed systems)General measures (skin irritants).Continuous process	No specific measures identified.	
General exposures.Use in contained batch processes	No specific measures identified.	
General exposures.Batch process	No specific measures identified.	
Product sampling.	Ensure dedicated sample points are provided.	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.	

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Bulk transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfersDedicated facility	No specific measures identified.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Bulk product storage(closed systems)	No specific measures identified.
Laboratory activities	No specific measures identified.
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

300000000674	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	Sector of Use: SU3, SU10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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 process		No specific measures identified.
General exposures (closed systems)General measures (skin irritants).Continuous process		No specific measures identified.
General exposures.Use in contained batch processes		No specific measures identified.
General exposures.Batch process		No specific measures identified.
Mixing operations (open systems)		Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Production or preparation		No specific measures identified.

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or articles by tableting, compression, extrusion or pelletisation	
Product sampling.	Ensure dedicated sample points are provided.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.
Bulk transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfersDedicated facility	No specific measures identified.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Bulk product storage(closed systems)	No specific measures identified.
Laboratory activities	No specific measures identified.
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

300000000675	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Uses in Coatings- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 10, PROC 13, PROC 15 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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)	No specific measures identified.	
General exposures (closed systems)with sample collection	No specific measures identified.	
Film formation - force drying, stoving and other technologies.	No specific measures identified.	
Film formation - air drying	No specific measures identified.	
Mixing operations (closed systems)	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 application	
Material transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfers	Use drum pumps or carefully pour from container.
Spraying (automatic/robotic)	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.
ManualSpraying	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.
Roller, spreader, flow application	Use long handled brushes and rollers where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dipping, immersion and pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	
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

300000000676	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Uses in Coatings- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 13, PROC 15, PROC 19 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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.	No specific measures identified.	
General exposures (closed systems)Use in contained systems	No specific measures identified.	
Preparation of material for application	No specific measures identified.	
Film formation - air drying	No specific measures identified.	
Film formation - force drying, stoving and other technologies.	No specific measures identified.	
Material trans-	Use drum pumps or carefully pour from container.	

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fersDrum/batch trans- fersNon-dedicated facility	
Material trans- fersDrum/batch trans- fersDedicated facility	No specific measures identified.
Roller, spreader, flow appli- cation	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.
ManualSpraying	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 pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Hand application - finger- paints, pastels, adhesives	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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	

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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

300000000679	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Cleaning Agents- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 7, PROC 8a, PROC 8b, PROC 10, PROC 13 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.

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 use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes 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 facility	Ensure material transfers are under containment or extract ventilation.
Use in contained systemsAutomated process with (semi) closed systems.	No specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container.
Filling/ preparation of equipment from drums or containers.Dedicated facility	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use in contained batch processesTreatment by heating	Provide extraction ventilation at points where emissions occur.

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Degreasing small objects in cleaning station	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Cleaning with low-pressure washers	Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Cleaning with high pressure washers	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.
Manual Cleaning Surfaces no spraying	Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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

300000000680	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Cleaning Agents- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 13 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 use of substance/product up to 100% (unless stated differently).
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes 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 facility	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use in contained systemsAutomated process with (semi) closed systems.	No specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container.
Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No specific measures identified.
Filling/ preparation of equipment from drums or containers.Non-dedicated facility	Use drum pumps or carefully pour from container.
ManualCleaningSurfacesDipping,	Wear chemically resistant gloves (tested to EN374) in com-

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immersion and pouring	combination with 'basic' employee training.
Cleaning with low-pressure washers	Use long handled tools where possible. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Cleaning with high pressure washers	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.
ManualCleaningSurfacesSpraying	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, Brushing	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Application of cleaning products in closed systems	No specific measures identified.
Cleaning of medical devices	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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.
For some of the Contributing Scenarios workplace exposures have been estimated from measured data.

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.

Section 4.2 -Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

300000000682	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Lubricants- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 17, PROC 18 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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)	No specific measures identified.	
General exposures (open systems)	Wear suitable gloves tested to EN374.	
Bulk transfersDedicated facility	No specific measures identified.	
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Filling/ preparation of equipment from drums or containers.	Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.	
Initial factory fill of equipment	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.	equipment and provide extract ventilation at openings. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Manual Rolling, Brushing	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	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Spraying	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	No specific measures identified.
Engine lubricant service	Handle substance within a closed system.
Maintenance of small items	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Remanufacture of reject articles	Provide extraction ventilation at points where emissions occur.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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.	

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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.

Section 4.2 -Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

300000000696	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in de-icing and anti-icing fluids- Professional
Use Descriptor	Sector of Use: SU22 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.

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.	Use dedicated equipment. , or: Ensure material transfers are under containment or extract ventilation.
Filling/ preparation of equipment from drums or containers.	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)	No specific measures identified.
Material transferselevated temperature	Use dedicated equipment. , or: Ensure material transfers are under containment or extract ventilation.
Spraying/ fogging by machine applicationelevated temperature	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	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	Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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

300000000695	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in functional fluids- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC1, PROC2, PROC3, PROC8a, 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 transfers	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 containers	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.	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)	No specific measures identified.	
Remanufacture of reject articles	Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374.	

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Equipment maintenance	Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374.
Storage.	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

300000000693	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in functional fluids- Industrial
Use Descriptor	Sector of Use: SU3 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.

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 facility	No specific measures identified.	
Bulk transfersNon-dedicated facility	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/equipment	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.	Use dedicated equipment. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures.(closed systems)	No specific measures identified.	

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General exposures.(open systems)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Equipment maintenance	Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374.
Remanufacture of reject articles	Drain down system prior to equipment opening or maintenance. Wear suitable gloves tested to EN374.
Storage.	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

300000000687	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Agrochemicals uses- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC 1, PROC 2, PROC 4, PROC 8a, PROC 8b, PROC 11, PROC 13 Environmental Release Categories: ERC8a, ERC8d
Scope of process	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.

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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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	
Transfer from/pouring from containersDedicated facility	No specific measures identified.	
Mixing operations (open systems)	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Spraying/ fogging by manual application	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.	
Spraying/ fogging by machine application	Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.	
Ad hoc manual application	Wear chemically resistant gloves (tested to EN374) in combi-	

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via trigger sprays, dipping, etc.	nation with 'basic' employee training.
Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Disposal of wastes	Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Storage.	Store substance within a closed system.
Section 2.2	Control of Environmental Exposure
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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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

300000000685	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Metal working fluids / rolling oils- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13, PROC 17 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.

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 use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes 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)	No specific measures identified.
Bulk transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	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 facility	No specific measures identified.
Filling/ preparation of equipment from drums or	Ensure material transfers are under containment or extract ventilation.

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containers.Non-dedicated facility	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Product sampling.	Use dedicated equipment. Wear suitable gloves tested to EN374.
Metal machining operations	Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
ManualRolling, Brushing	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	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Spraying	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 facility	No specific measures identified.
Equipment cleaning and maintenanceNon-dedicated facility	Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	

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

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE
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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

300000000684	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Metal working fluids / rolling oils- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 17 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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)	No specific measures identified.	
General exposures (open systems)	Wear suitable gloves tested to EN374.	
Bulk transfersDedicated facility	No specific measures identified.	
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.	
Filling/ preparation of equipment from drums or containers.	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Product sampling.	Use dedicated equipment. Wear suitable gloves tested to EN374.	

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Metal machining operations	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 pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Spraying	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.
ManualRolling, Brushing	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use long handled brushes and rollers where possible.
Automated metal rolling/forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Semi-automated metal rolling/forming	Provide extraction ventilation at points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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. For some of the Contributing Scenarios workplace exposures have been estimated from measured data.	
Section 3.2 -Environment	
No exposure assessment presented for the environment.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
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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.

Section 4.2 -Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

300000000700	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Water treatment chemicals- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 13 Environmental Release Categories: ERC3, ERC4
Scope of process	Covers the use of the substance for the treatment of water at industrial facilities in open and closed systems.

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 use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes 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)	No specific measures identified.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Bulk transfersDedicated facility	No specific measures identified.
Bulk transfersNon-dedicated facility	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Pouring from small containers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dipping, immersion and pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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

300000000699	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in laboratories- Professional
Use Descriptor	Sector of Use: SU22 Process Categories: PROC 15 Environmental Release Categories: ERC8a
Scope of process	Use of small quantities within laboratory settings, including material transfers 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 Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes 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	No specific measures identified.
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	

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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

300000000698	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in laboratories- Industrial
Use Descriptor	Sector of Use: SU3 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.

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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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	No specific measures identified.	
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	

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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

300000000981	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Oil and Gas field drilling and production operations-Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b 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 use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes 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 measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.	
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	
Bulk transfers from tote tanks and supply vessels	No specific measures identified.	
Filling/ preparation of equipment from drums or	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combi-	

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containers.	nation with 'basic' employee training.
Drilling mud (re-)formulation	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Drill floor operations	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Operation of solids filtering equipmentelevated temperature	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Cleaning of solids filtering equipment	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 solids	Wear suitable gloves tested to EN374. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Process sampling	Wear suitable gloves tested to EN374.
General exposures (closed systems)	No specific measures identified.
Pouring from small containers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage.	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	

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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.

Section 4.2 -Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Consumer

300000001094	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Uses in Coatings - Consumer
Use Descriptor	Sector of Use: SU21 Product Categories: PC1, PC9a, PC15, PC18, PC31, PC32 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	
Concentration of the Sub-stance in Mixture/Article	Unless stated otherwise.	
	Covers concentration up to (%): 5 %	
Amounts Used		
Unless stated otherwise.		
for each use event, covers amount up to (g):		9.000
Frequency and Duration of Use		
Unless stated otherwise.		
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.	
	Covers concentrations up to 5 %	
Coatings and paints, thin-ners, paint removers Wa-terborne latex wall paint.		

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	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 2,20 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 5 %
	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 2,20 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 5 %
	For each use event, covers amount up to 1.250 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 5 %
	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 2,20 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 5 %
	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 2,20 hours/event
	covers skin contact area up to (cm2): 1.900 cm2

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	Covers use in room size of 20 m3
	Covers use under typical household ventilation.
	Covers use at ambient temperatures.
Non-metal-surface treatment products Solvent rich, high solid, water borne paint.	Covers concentrations up to 5 %
	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 2,20 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 5 %
	For each use event, covers amount up to 1.250 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 5 %
	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 2,20 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.
Polishes and wax blends Polishes, wax / cream (floor, furniture, shoes).	Covers concentrations up to 2,5 %
	For each use event, covers amount up to 550 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 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.

Section 2.2

Control of Environmental Exposure

No exposure assessment presented for the environment.

SECTION 3

EXPOSURE ESTIMATION

Section 3.1 - Health

The Consexpo model 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

300000001095	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Cleaning Agents - Consumer
Use Descriptor	Sector of Use: SU21 Product Categories: 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
Product Categories	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Washing and cleaning products (including solvent based products) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners).	Covers concentrations up to 20 %
	For each use event, covers amount up to 500 g
	covers use up to 104 day/year
	Covers use up to 1 times/day of use
	Covers exposure up to 0,01 hours/event
	covers skin contact area up to (cm2): 215 cm2
	Covers use in room size of 1 m3
	Covers use under typical household ventilation.
	Covers use at ambient temperatures.
Washing and cleaning products (including solvent based products) Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners).	Covers concentrations up to 4 %
	For each use event, covers amount up to 400 g

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	covers use up to 104 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.
Washing and cleaning products (including solvent based products) Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners).	Covers concentrations up to 5 %
	For each use event, covers amount up to 19 g
	covers use up to 365 day/year
	Covers use up to 1 times/day of use
	Covers exposure up to 1 hours/event
	covers skin contact area up to (cm2): 1.900 cm2
	Covers use in room size of 15 m3
	Covers use under typical household ventilation.
	Covers use at ambient temperatures.

Section 2.2	Control of Environmental Exposure
No exposure assessment presented for the environment.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The Consexpo model 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

300000001096	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in de-icing and anti-icing fluids - Consumer
Use Descriptor	Sector of Use: SU21 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 Substance 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
Covers exposure up to (hours/event):		4
Product Categories	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Anti-Freeze and de-icing products Washing car window.	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 radiator.	Covers concentrations up to 30 %	
	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.

Section 2.2	Control of Environmental Exposure
No exposure assessment presented for the environment.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The Consexpo model 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

300000001097	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Other Consumer Uses - Consumer
Use Descriptor	Sector of Use: SU21 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
No exposure assessment presented for the environment.	

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.	

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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