1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

<table>
<thead>
<tr>
<th>Trade name</th>
<th>GLYCOL ETHER EB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Ethylene glycol monobutyl ether; Glycol butyl ether; Butyl glycol (BG); Ethylene glycol butyl ether (EGBE)</td>
</tr>
<tr>
<td>Substance name</td>
<td>2-butoxyethanol</td>
</tr>
<tr>
<td>Substance No.</td>
<td>111-76-2</td>
</tr>
<tr>
<td>Chemical characterization</td>
<td>Glycol Ethers</td>
</tr>
</tbody>
</table>

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

Identified uses: Manufacture of substances; Formulation & (re)packing of substance and mixtures; Distribution of substance; Uses in Coatings; Use in Cleaning Agents

1.3 Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Company</th>
<th>Registration number</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lyondell Chemie Nederland, B.V.</td>
<td>01-2119475108-36-0009</td>
<td>31 (0) 10 275 55 00</td>
</tr>
<tr>
<td>Delftseplein 27E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3013 AA Rotterdam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mail address: <a href="mailto:product.safety@lyb.com">product.safety@lyb.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsible/issuing person</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.4 Emergency telephone

Lyondell Chemie Nederland, B.V. +32 3 575 1235

Poison Center:
National Poisons Information Service
UK: +44 131 242 1383
24 hours all days

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

- Acute toxicity; Oral Category 4: H302
- Acute toxicity; Inhalation Category 4: H332
- Acute toxicity; Dermal Category 4: H312
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

GLYCOL ETHER EB
Version 1.4 Revision Date 02/26/2016 Print Date 11/07/2016 SDS No.: 3396

Skin corrosion/irritation Category 2: H315
Serious eye damage/eye irritation Category 2A: H319

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal Word: Warning

Hazard Statements
H302 Harmful if swallowed.
H332 Harmful if inhaled.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary Statements

Prevention:
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).
3. Composition/information on ingredients

3.1 Substances

Chemical nature: Substance

Ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EINECS-No. / ELINCS No./EC-No.</th>
<th>Weight %</th>
<th>Component Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-butoxyethanol</td>
<td>111-76-2 / 203-905-0</td>
<td>&lt;99.5 %</td>
<td>A</td>
</tr>
</tbody>
</table>

Key:
(A) Substance

4. First aid measures

4.1 Description of first-aid measures

General advice: Inhalation of high vapor concentrations can cause CNS-depression and narcosis. Consult a physician/doctor if necessary. Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Show this material safety data sheet to the doctor in attendance.

If inhaled: Call a physician or poison control center immediately. Move to fresh air. If unconscious place in recovery position and seek medical advice.

In case of skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed: Clean mouth with water and drink afterwards plenty of water. Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person. Call a POISON CENTER/doctor.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: irritant effects
Inhalation may cause CNS depression.

Hazards: Harmful if swallowed.
Causes skin irritation.
Causes serious eye irritation.
May cause drowsiness or dizziness.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically.
Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media:
SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam.
LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

Unsuitable extinguishing media:
Do not use solid water stream.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting:
Evacuate area.
Eliminate all ignition sources if safe to do so.
Flash back possible over considerable distance.
Fight fire with normal precautions from a reasonable distance.
Cool closed containers exposed to fire with water spray.

5.3 Advice for firefighters

Special protective equipment for fire-fighters:
Wear positive pressure self-contained breathing apparatus (SCBA).
Structural firefighter’s protective clothing will only provide limited protection.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
6.2 Environmental precautions

Environmental precautions: Do not allow contact with soil, surface or ground water. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant). Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and materials for containment and cleaning up

Methods for containment / Methods for cleaning up: Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material.

6.4 Reference to other sections

Additional advice: See section 8 for additional PPE information.

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling: Containers, even those that have been emptied, will retain product residue and vapor and should be handled as if they were full. Do not eat, drink or smoke in areas where this material is used. After handling, always wash hands thoroughly with soap and water. Do not handle near heat, sparks, or flame. Avoid contact with incompatible agents. Use only with adequate ventilation/personal protection. Avoid contact with eyes, skin
7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:
- Prevent unauthorized access.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep container tightly closed in a dry and well-ventilated place.
- Containers which are opened must be carefully resealed and kept upright to prevent leakage.
- Observe label precautions.
- Electrical installations / working materials must comply with the technological safety standards.

7.3 Specific end use(s)

8. Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Type</th>
<th>Limit Value</th>
<th>Basis</th>
<th>Revision Date</th>
<th>Additional Information</th>
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</thead>
<tbody>
<tr>
<td>2-butoxyethanol</td>
<td>111-76-2</td>
<td>TWA</td>
<td>20 ppm</td>
<td>US (ACGIH)</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>2-butoxyethanol</td>
<td>111-76-2</td>
<td>STEL</td>
<td>50 ppm 246 mg/m³</td>
<td>2000/39/EC (EU)</td>
<td>December 17, 2009</td>
<td></td>
</tr>
<tr>
<td>2-butoxyethanol</td>
<td>111-76-2</td>
<td>TWA</td>
<td>20 ppm 98 mg/m³</td>
<td>2000/39/EC (EU)</td>
<td>December 17, 2009</td>
<td></td>
</tr>
<tr>
<td>2-butoxyethanol</td>
<td>111-76-2</td>
<td>STEL</td>
<td>50 ppm 246 mg/m³</td>
<td>WEL (GB)</td>
<td>October 2007</td>
<td></td>
</tr>
</tbody>
</table>
2-butoxyethanol  |  111-76-2  |  TWA  |  25 ppm  |  123 mg/m³  |  WEL (GB)  |  October 2007

Consult local authorities for acceptable exposure limits.

DN(M)EL : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Acute systemic effects

DN(M)EL : End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Acute systemic effects
Value: 663 mg/m³

DN(M)EL : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Acute local effects

DN(M)EL : End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Acute local effects
Value: 246 mg/m³
Based on IOEL

DN(M)EL : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Acute local effects
Value: 98 mg/m³
Based on IOEL divided by 2 (assessment factor)

DN(M)EL : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Long-term systemic effects

DN(M)EL : End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Long-term systemic effects

DN(M)EL : End Use: General Population
Routes of exposure: Skin contact
Potential health effects: Acute systemic effects

DN(M)EL : End Use: General Population
Routes of exposure: Inhalation
Potential health effects: Acute systemic effects
Value: 426 mg/m³

DN(M)EL
End Use: General Population
Routes of exposure: Ingestion
Potential health effects: Acute systemic effects

DN(M)EL
End Use: General Population
Routes of exposure: Skin contact
Potential health effects: Acute local effects

DN(M)EL
End Use: General Population
Routes of exposure: Inhalation
Potential health effects: Acute local effects
Value: 123 mg/m³
Based on IOEL divided by 2 (assessment factor)

DN(M)EL
End Use: General Population
Routes of exposure: Skin contact
Potential health effects: Long-term systemic effects

DN(M)EL
End Use: General Population
Routes of exposure: Inhalation
Potential health effects: Long-term systemic effects
Value: 49 mg/m³

DN(M)EL
End Use: General Population
Routes of exposure: Ingestion
Potential health effects: Long-term systemic effects
Based on LOAEL divided by 3 (assessment factor)

DN(M)EL
End Use: General Population
Routes of exposure: Skin contact
Potential health effects: Long-term local effects

DN(M)EL
End Use: General Population
Routes of exposure: Inhalation
Potential health effects: Long-term local effects

8.2 Exposure controls

Engineering measures
Ensure that eyewash stations and safety showers are close to the workstation location.
Handle only in a place equipped with local exhaust (or other appropriate exhaust).

Personal protective equipment
Respiratory protection: When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection: Wear chemical resistant gloves (EN374) such as:
Butyl rubber.
Neoprene.
Eye and face protection : Safety glasses with side-shields conforming to EN166

Skin and body protection : Appropriate protective clothing should be worn to prevent skin contact.

Hygiene measures : Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use.

Environmental exposure controls
General advice : See section 6.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : liquid
Color : colorless
Odor : Mild odor.
: Ether-like odor.

Flash point : 68 - 70 °C
Method: Tag closed cup

Ignition temperature : 230 - 245 °C

Lower explosion limit : 1.1 vol%

Upper explosion limit : 10.6 vol%

Flammability (solid, gas) : Not applicable

Oxidizing properties : Not considered an oxidizing agent.

Autoignition temperature : 230 - 245 °C

Molecular weight : 118.17 g/mol

Decomposition temperature : not determined
Melting point/freezing point: -74.8 °C
Boiling point/boiling range: 171 - 173.5 °C
Vapor pressure: 0.8 - 1.0 hPa at 20 °C
Density: 0.90 g/cm³ at 20 °C
Water solubility: Miscible
Partition coefficient: n-octanol/water log Pow: 0.81 at 25 °C
Viscosity, dynamic: 3.3 mPa.s at 20 °C
Viscosity, kinematic: 20 mm²/s at 20 °C
Relative vapor density: 4.1 (Air = 1.0)
Evaporation rate: 0.1
Explosive properties: Not explosive

9.2 Other information

10. Stability and reactivity

10.1 Reactivity
May form peroxides in the presence of air.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions: No dangerous reaction known under conditions of normal use. Reacts with air to form peroxides.

10.4 Conditions to avoid
Conditions to avoid: Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid: Oxidizing agents
Acids
Bases
Amines
Ammonia
Acid chlorides

10.6 Hazardous decomposition products

Hazardous decomposition products: Not expected to decompose under normal conditions.
Thermal decomposition: Note: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

11. Toxicological information

11.1 Information on toxicological effects

Product Summary: The below given information is based on the assessment of the product including impurities.

Acute toxicity

Acute oral toxicity: Classified
Harmful if swallowed.

: Ingestion may cause weakness, confusion, anxiety, decreased blood pressure, and CNS depression with collapse and coma.

: LD50: 1,414 mg/kg
Species: Guinea pig

Acute inhalation toxicity: Classified
Harmful by inhalation.

: Exposure to very high concentrations of aerosols may cause irritation of the eyes, nose, and throat and depression of the central nervous system.

: LC50: 932 ppm
Exposure time: 4 HOURS
Species: Guinea pig
Acute dermal toxicity: Classified
Harmful in contact with skin.

LD50: > 2,000 mg/kg
Species: Guinea pig

Skin corrosion/irritation: Classified
Causes skin irritation.

Serious eye damage/eye irritation: Classified
Causes serious eye irritation.

Respiratory or skin sensitization: Respiratory sensitization
Not classified
No study available.

Skin sensitization: Skin sensitization
Not classified
No adverse effect observed.

Chronic toxicity

Carcinogenicity: Not classified
Long-term exposure via inhalation at concentrations up to 125 ppm caused an increase in the incidence of liver tumors in male mice and forestomach tumors in female mice. A slight increase in adrenal tumors was observed in female rats. The NTP has determined that EGBE displays some evidence of carcinogenicity in mice, and equivocal evidence of carcinogenicity in female rats.

Germ cell mutagenicity: Not classified
No adverse effect observed.

Reproductive toxicity

Effects on fertility: Not classified
Effects on or via lactation: No adverse effect observed.
Effects on Development: Not classified
No adverse effect observed.

**Target Organ Systemic Toxicant - Single exposure**
- Based on single exposure toxicity values, not classified.
- High concentrations may cause central nervous system depression.

**Target Organ Systemic Toxicant - Repeated exposure**
- Based on repeated exposure toxicity values, not classified.
- Results from acute and repeat exposure studies in rats, mice and rabbits indicate that EGBE causes injury to red blood cells with subsequent intravascular hemolysis and anemia, and secondary changes in the liver and kidney. Human and guinea pig red blood cells are resistant to EGBE injury and therefore the effects noted in sensitive species are not relevant to humans.

**Aspiration hazard**
- Based on physico-chemical values or lack of human evidence, not classified.

### 12. Ecological information

#### 12.1 Toxicity

**Toxicity to fish**
- Low acute toxicity to fish

**Toxicity to daphnia and other aquatic invertebrates**
- Low acute toxicity to aquatic invertebrates.

**Toxicity to algae**
- Low toxicity to algae.

**Toxicity to bacteria**
- Low toxicity to sewage microbes.

**Toxicity to fish (Chronic toxicity)**
- Chronic toxicity to fish is expected to be low.

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**
- Chronic toxicity expected to be low.
Acute aquatic toxicity : Based on acute aquatic toxicity values, not classified.
Chronic aquatic toxicity : Not classified, based on readily biodegradability and low acute toxicity.

12.2 Persistence and degradability

Biodegradability : 90.4 %
Rapidly degradable.
(After 28 days in a ready biodegradability test)

12.3 Bioaccumulative potential

Bioaccumulation : Bioconcentration factor (BCF): 3.16
Method: (QSAR calculated value)
This material is not expected to bioaccumulate.

12.4 Mobility in soil

Distribution among environmental compartments : Stability in water
Not expected to hydrolyze readily.
Contains no functional groups considered likely to be hydrolyzed in water.

Stability in soil
Low absorption to soil particulates predicted

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT), This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Additional ecological information : No additional information available.

13. Disposal considerations

13.1 Waste treatment methods

Product : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of as hazardous waste in compliance with local and national regulations.
14. Transport information

Not regulated for transport

15. Regulatory information

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

Water contaminating class: WGK 1 slightly water endangered
(Germany)

REACh status

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that the chemical substance in this product has been pre-registered or, where required under REACh, registered, and that we have the intention to proceed with any required registration in accordance with the deadlines set forth in REACh. (Regulation (EU) No. 1907/2006)

Other international regulations

Global Inventory Status

The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

*Additional Explanatory Status Statements follow the table, as necessary.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Inventory</th>
<th>Status Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>AICS</td>
<td>Compliant</td>
</tr>
<tr>
<td>Canada</td>
<td>DSL</td>
<td>Compliant</td>
</tr>
<tr>
<td>China</td>
<td>IECSC</td>
<td>Compliant</td>
</tr>
<tr>
<td>Europe</td>
<td>REACH</td>
<td>See REACH Compliance Statement</td>
</tr>
<tr>
<td>Japan</td>
<td>ENCS</td>
<td>Compliant</td>
</tr>
<tr>
<td>Korea</td>
<td>KECI</td>
<td>Compliant</td>
</tr>
<tr>
<td>New Zealand</td>
<td>NZIoC</td>
<td>Compliant</td>
</tr>
<tr>
<td>Philippines</td>
<td>PICCS</td>
<td>Compliant</td>
</tr>
<tr>
<td>United States of America</td>
<td>TSCA</td>
<td>Compliant</td>
</tr>
<tr>
<td>Taiwan</td>
<td>TCSCA</td>
<td>Compliant</td>
</tr>
</tbody>
</table>

Contact product.safety@lyb.com for additional global inventory information.

15.2 Chemical safety assessment

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

Material safety datasheet sections which have been updated:
Revised Section(s): 9 Revision Date February 26 2016

Full text of H-Statements referred to under sections 2 and 3.

H302  Harmful if swallowed.
H312  Harmful in contact with skin.
H315  Causes skin irritation.
H319  Causes serious eye irritation.
H332  Harmful if inhaled.

Disclaimer

Multiple legal entities and registration numbers may be displayed in Section 1. The Recipient shall refer to the shipping documents to identify the legal entity that supplied this product.

This document is generated for the purpose of distributing health, safety, and environmental data. Information is correct to the best of our knowledge at the date of the SDS publication. It is not a specification sheet nor should any displayed data be construed as a specification. Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

Users should review the applicable Safety Data Sheet before handling the product. This product(s) may not be used in the manufacture of any of the following, without prior written approval by Seller for each specific product and application:
(i) U.S. FDA Class I or II Medical Devices; Health Canada Class I, II or III Medical Devices; European Union Class I or II Medical Devices;
(ii) film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices;
(iii) packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration;
(iv) tobacco related products and applications, electronic cigarettes and similar devices.

The product(s) may not be used in:
(i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices;
(ii) applications involving permanent implantation into the body;
(iii) life-sustaining medical applications.

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Disclaimer

All references to U.S. FDA, Health Canada, and European Union regulations include another country’s equivalent regulatory classification. In addition to the above, LyondellBasell may further prohibit or restrict the use of its products in certain applications. For further information, please contact a LyondellBasell representative.

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Section 1: Title of Exposure Scenario

Short title          Manufacture of substances

Use Descriptors

Sector of use:
SU3: Industrial Manufacturing (all)

Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC15: Use as laboratory reagent

Environmental release category:
ERC1: Manufacture of substances

Processes, tasks activities covered
Manufacture of the substance or use as an intermediate or 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
Colorless liquid with relatively low Vapour pressure. It is readily absorbed through the skin. Low potential for bioaccumulation.

**Section 2.1: Control of environmental exposure**

**Product characteristics**

**Physical Form (at time of use)** Liquid, vapor pressure < 0.5 kPa

**Water solubility** Miscible

**Biodegradability** Readily biodegradable

**Remarks** Low potential for bioaccumulation.

**Amount used**

Amounts used in the EU (tonnes/year) 45000 ton(s)/year

Maximum daily site tonnage 150000 KG

Fraction of EU tonnage used in region 1

Fraction of main source to local environment 0

Fraction of substance in end-use products 1

**Frequency and duration of use**

300 days/year Continuous

**Environment factors not influenced by risk management**

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Remarks Manufacturing is made in a closed process.

**Other given operational conditions affecting environmental exposure**
Number of emission days per year 300

Remarks
Local release to air (kg/day): 0.1
Local release to waste water (kg/day): 21.9
Local release to soil (kg/day): 0

Technical conditions and measures / Organizational measures

Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation.
Onsite wastewater treatment required
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
A leak prevention plan is needed to prevent low level continual releases.
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent
2,000 m³/d
Percentage removed from waste water 87.4 %

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations.
Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

Conditions and measures related to external recovery of waste
Not applicable

Other environmental control measures additional to above
No specific measures identified.

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use)  Liquid, vapor pressure < 0.5 kPa

Concentration of the Substance in Mixture/Article  Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount used

Remarks  Not applicable.

Frequency and duration of use

Frequency of use  8 hours/day

Remarks  Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

None identified for this scenario.

Other operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature.

Contributing scenario controlling worker exposure for:

Risk Management Measures

CS1: General exposures  Handle substance within a closed system
Clear spills immediately.

CS54: Continuous process  Drain down and flush system prior to equipment opening or maintenance.
Retain drain downs in sealed storage pending disposal or for subsequent recycle.
CS1: General exposures
Handle substance within a closed system

CS54: Continuous process
Use suitable eye protection.

CS56: with sample collection
Wear suitable gloves tested to EN374.

CS1: General exposures
Handle substance within a closed system

CS37: Use in contained batch processes CS56: with sample collection
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS2: Process sampling
Handle substance within a closed system
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS14: Bulk transfers CS59: Internal
Handle substance within a closed system
Clear transfer lines prior to de-coupling.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS39: Equipment cleaning and maintenance
Drain down and flush system prior to equipment opening or maintenance.
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour).
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS14: Bulk transfers CS58: Transport
Handle substance within a closed system
Clear transfer lines prior to de-coupling.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS85: Bulk product storage
Transfer via enclosed lines.
Store substance within a closed system.
Avoid dip sampling.
Ensure material transfers are under containment or extract ventilation.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS36: Laboratory activities
Use suitable eye protection.
Wear suitable gloves tested to EN374.

Section 3: Exposure estimation and reference to its source

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.
Environment: No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health: Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment: Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title: Formulation & (re)packing of substance and mixtures

Use Descriptors

Sector of use:
SU3: Industrial Manufacturing (all)

Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletization
PROC15: Use as laboratory reagent

Environmental release category:
ERC2: Formulation of preparations
SpERC 4: ESVOC SpERC 4

Processes, tasks activities covered
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities

Section 2: Operational conditions and risk management measures
Colorless liquid with relatively low Vapour pressure. It is readily absorbed through the skin. Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use)  Liquid, vapor pressure < 0.5 kPa
Water solubility  Miscible
Biodegradability  Readily biodegradable
Remarks  Low potential for bioaccumulation.

Amount used

Amounts used in the EU (tonnes/year)  25000 ton(s)/year
Maximum daily site tonnage  85000 KG
Fraction of EU tonnage used in region  1

Frequency and duration of use

300 days/year Continuous

Environment factors not influenced by risk management

Dilution Factor (River)  10
Dilution Factor (Coastal Areas)  100

Other given operational conditions affecting environmental exposure
Number of emission days per year: 300

Emission or Release Factor: Air: 1E-02

Emission or Release Factor: Water: 5E-03

Emission or Release Factor: Soil: 1E-04

Remarks:
- Release fraction to air from process (initial release prior to RMMM): 0.01
- Local release to air (kg/day): 85
- Release fraction to wastewater from process (initial release prior to RMMM): 0.005
- Local release to waste water (kg/day): 42.5
- Release fraction to soil from process (initial release prior to RMMM): 0.0001
- Local release to soil (kg/day): 0.85

Technical conditions and measures / Organizational measures

Treatment of air emissions is not required for the purposes of REACh compliance but may be needed to comply with other environmental legislation.

Onsite wastewater treatment required. All waste water emissions should be discharged to domestic sewage treatment or collected and sent for waste disposal.

All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Bund storage facilities to prevent soil and water pollution in the event of spillage.

A leak prevention plan is needed to prevent low level continual releases.

Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Prevent discharge of undissolved substance to or recover from wastewater.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent: 2,000 m3/d

Percentage removed from waste water: 87.4 %

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations.

Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

**Conditions and measures related to external recovery of waste**
Not applicable

**Other environmental control measures additional to above**
No specific measures identified.

**Section 2.2: Control of worker exposure**

**Product characteristics**

**Physical Form (at time of use)** Liquid, vapor pressure $< 0.5$ kPa

**Concentration of the Substance in Mixture/Article** Covers the percentage of the substance in the product up to 100 % (unless stated differently).

**Amount used**

**Remarks** Not applicable.

**Frequency and duration of use**

**Frequency of use** 8 hours/day

**Remarks** Covers daily exposures up to 8 hours (unless stated differently).

**Human factors not influenced by risk management**
None identified for this scenario.

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

<table>
<thead>
<tr>
<th>Contributing scenario</th>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
controlling worker exposure for:

CS1: General exposures
CS54: Continuous process
CS57: no sampling: (e.g. In-line additive dosing equipment, in-line filter cleaning)
Handle substance within a closed system

CS1: General exposures
CS54: Continuous process
CS56: with sample collection
Handle substance within a closed system
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS1: General exposures
CS37: Use in contained batch processes CS56: with sample collection
Handle substance within a closed system
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS1: General exposures
CS16: General exposures (open systems)
Handle substance within a closed system
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS2: Process sampling
Handle substance within a closed system
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS14: Bulk transfers
Handle substance within a closed system
Clear transfer lines prior to de-coupling.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS30: Mixing operations (open systems)
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS22: Transfer from/pouring from containers
CS34: Manual
Use drum pumps or carefully pour from container.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS39: Equipment cleaning and maintenance
Drain down and flush system prior to equipment opening or maintenance.
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour).
Use suitable eye protection.
Wear suitable gloves tested to EN374.
CS8: Drum/batch transfers
Avoid spillage when withdrawing pump.
Use drum pumps or carefully pour from container.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS6: Drum and small package filling
Clear spills immediately.
Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Put lids on containers immediately after use.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS85: Bulk product storage
Transfer via enclosed lines.
Store substance within a closed system.
Avoid dip sampling.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS36: Laboratory activities
Use suitable eye protection.
Wear suitable gloves tested to EN374.

Section 3: Exposure estimation and reference to its source

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.

Environment
No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment
Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title
Distribution of substance

Use Descriptors
Sector of use:
SU3: Industrial Manufacturing (all)

Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent

Environmental release category:
ERC1: Manufacture of substances
ERC2: Formulation of preparations
SpERC 3: ESVOC SpERC 3

Processes, tasks activities covered
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its distribution and associated laboratory activities

Section 2: Operational conditions and risk management measures
Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapor pressure < 0.5 kPa
Water solubility Miscible
Biodegradability Readily biodegradable
Remarks Low potential for bioaccumulation.

Amount used
Amounts used in the EU (tonnes/year) 25000 ton(s)/year
Maximum daily site tonnage 85000 KG
Fraction of EU tonnage used in region 1.0

Frequency and duration of use
300 days/year Continuous

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Number of emission days per year 300
Emission or Release Factor: Air 1E-04
Emission or Release Factor: Water 1E-05
Emission or Release Factor: Soil 0E+00

Remarks
Release fraction to air from process (initial release prior to RMMM): 0.0001
Release fraction to wastewater from process (initial release prior to RMMM): 0.00001
Release fraction to soil from process (initial release prior to RMMM): 0
Local release to soil (kg/day): 0

Technical conditions and measures / Organizational measures
Treatment of air emissions is not required for the purposes of REACh compliance but may be needed to comply with other environmental legislation. Onsite wastewater treatment required
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
A leak prevention plan is needed to prevent low level continual releases.
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Prevent discharge of undissolved substance to or recover from wastewater

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent

<table>
<thead>
<tr>
<th>Flow rate of sewage treatment plant</th>
<th>2,000 m3/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage removed from waste water</td>
<td>87.4 %</td>
</tr>
</tbody>
</table>

**Conditions and measures related to external treatment of waste for disposal**

External treatment and disposal of waste should comply with applicable local and/or national regulations
Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

**Conditions and measures related to external recovery of waste**

Not applicable

**Other environmental control measures additional to above**

No specific measures identified.

**Section 2.2: Control of worker exposure**

**Product characteristics**

**Physical Form (at time of use)** Liquid, vapor pressure < 0.5 kPa

**Concentration of the Substance in Mixture/Article** Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Amount used

Remarks Not applicable.

Frequency and duration of use

Frequency of use 8 hours/day

Remarks Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

None identified for this scenario.

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenario controlling worker exposure for:

<table>
<thead>
<tr>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS15: General exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning)</td>
</tr>
<tr>
<td>Continuous OC9: Outdoor: daily; : 15 mins - 1 hour: Product temperature</td>
</tr>
<tr>
<td>CS15: General process exposures (occasional controlled exposure)</td>
</tr>
<tr>
<td>Continuous OC9: Outdoor: daily; : 15 mins - 1 hour: Product temperature</td>
</tr>
<tr>
<td>CS15: General process exposures - closed batch process CS55: Batch process OC9: Outdoor: daily; : 15 mins - 1 hour:</td>
</tr>
<tr>
<td>Use suitable eye protection.</td>
</tr>
</tbody>
</table>

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| CS16: General process exposures - open batch process | Clear transfer lines prior to de-coupling. |
| OC8: Indoor | Ensure samples are obtained under containment or extract ventilation. |
| OC9: Outdoor : 15 mins - 1 hour : Product temperature | Wear suitable gloves tested to EN374. |

| CS2: Process sampling | Avoid dip sampling. |
| | Wear suitable gloves tested to EN374. |

| CS36: Laboratory activities : daily; : 15 mins - 1 hour : Product temperature OC8: Indoor | Use suitable eye protection. |
| | Wear suitable gloves tested to EN374. |

| CS501: Bulk closed loading and unloading : (e.g. Road/rail car bottom loading/unloading; marine vessel/barge loading/unloading;) CS14: Bulk transfers CS107: (closed systems) OC9: Outdoor : daily; : 15 mins - 1 hour : Product temperature : Exposure potential during breaking of hose connection | Clear transfer lines prior to de-coupling. |
| | Ensure material transfers are under containment or extract ventilation. |
| | Wear suitable gloves tested to EN374. |
| | Use suitable eye protection. |

| CS504: Bulk open loading : (e.g. Road/rail car top loading, may involve LEV) CS14: Bulk transfers CS108: (open systems) OC9: Outdoor : daily; : 1-4 hours : Product temperature : Exposure potential from vapor emissions from tank opening | Clear transfer lines prior to de-coupling. |
| | Ensure material transfers are under containment or extract ventilation. |
| | Use suitable eye protection. |
| | Wear suitable gloves tested to EN374. |

| CS6: Drum and small package filling OC8: Indoor | Clear spills immediately. |
| CS54: Continuous process : daily; : 8 hours : Product temperature | Fill containers/cans at dedicated filling points supplied with local extract ventilation. |
| | Use suitable eye protection. |
| | Wear suitable gloves tested to EN374. |

| CS26: Clean down and maintenance : daily; : 15 | Apply vessel entry procedures including use of forced supplied air. |
Section 1: Title of Exposure Scenario

Short title
Use in Coatings

Use Descriptors

Sector of use:
SU3: Industrial Manufacturing (all)
Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7: Industrial spraying
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent

Environmental release category:
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Processes, tasks activities covered
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
Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure
Product characteristics

Physical Form (at time of use)    Liquid, vapor pressure < 0.5 kPa
Water solubility               Miscible
Biodegradability               Readily biodegradable
Remarks                        Low potential for bioaccumulation.
Amount used

Amounts used in the EU (tonnes/year) 14000 ton(s)/year
Maximum daily site tonnage 47000 KG
Fraction of EU tonnage used in region 1.0
Fraction of substance in end-use products 1.0

Frequency and duration of use

300 days/year Continuous

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Number of emission days per year 300
Emission or Release Factor: Air 9.8E-02
Emission or Release Factor: Water 2E-02
Emission or Release Factor: Soil 0E+00
Remarks
Release fraction to air from process (initial release prior to RMMM): 0.098
Local release to air (kg/day): 460
Release fraction to wastewater from process (initial release prior to RMMM): 0.02
Local release to waste water (kg/day): 94
Release fraction to soil from process (initial release prior to RMMM): 0
Local release to soil (kg/day): 0

Technical conditions and measures / Organizational measures
Treatment of air emissions is not required for the purposes of REACh compliance but may be needed to comply with other environmental legislation.

Onsite wastewater treatment required
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
A leak prevention plan is needed to prevent low level continual releases.
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent
2,000 m3/d

Percentage removed from waste water
87.4 %

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations
Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

Conditions and measures related to external recovery of waste

Not applicable

Other environmental control measures additional to above

No specific measures identified.

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use) Liquid, vapor pressure < 0.5 kPa

Concentration of the Substance in Mixture/Article Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Amount used

Remarks
Not applicable.

Frequency and duration of use

Frequency of use
8 hours/day

Remarks
Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

None identified for this scenario.

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented.

<table>
<thead>
<tr>
<th>Contributing scenario controlling worker exposure for:</th>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS15: General exposures (closed systems)</td>
<td>Handle substance within a closed system</td>
</tr>
<tr>
<td>CS15: General exposures (closed systems) CS56: with sample collection CS38: Use in contained systems</td>
<td>Handle substance within a closed system Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS94: Film formation - force drying (50 - 100°C). Stoving (&gt;100°C). UV/EB radiation curing</td>
<td>Handle substance within a closed system Ensure material transfers are under containment or extract ventilation. Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS29: Mixing operations (closed systems) CS15: General exposures (closed systems)</td>
<td>Handle substance within a closed system Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS95: Film formation - air</td>
<td>Avoid manual contact with wet work pieces.</td>
</tr>
</tbody>
</table>
drying

Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS96: Preparation of material for application
CS30: Mixing operations (open systems)

Avoid manual contact with wet work pieces.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS97: Spraying (automatic/robotic)

Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
Use suitable eye protection.

CS10: Spraying CS34: Manual

Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour).
Wear a respirator conforming to EN140 with Type A filter or better.
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
Use suitable eye protection.

CS3: Material transfers

Clear transfer lines prior to de-coupling.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS3: Material transfers

Clear transfer lines prior to de-coupling.
Provide extraction ventilation at points where emissions occur.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS98: Roller, spreader, flow application

Provide enhanced general ventilation by mechanical means.
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS4: Dipping, immersion and pouring

Avoid manual contact with wet work pieces.
Clear up spills immediately and dispose of waste safely.
Provide enhanced general ventilation by mechanical means.
or;
Wear suitable gloves tested to EN374.

CS36: Laboratory activities

Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS3: Material transfers CS8:

Use suitable eye protection.
Drum/batch transfers CS22: Wear suitable gloves tested to EN374.
Transfer from/pouring from containers

Section 3: Exposure estimation and reference to its source

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.

Environment
No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment
Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title
Use in Coatings

Use Descriptors

Sector of use:
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC10: Roller application or brushing
PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent
PROC19: Hand-mixing with intimate contact and only PPE available
Environmental release category:
ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems

Processes, tasks activities covered
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

Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapor pressure < 0.5 kPa
Water solubility Miscible

Biodegradability Readily biodegradable

Remarks Low potential for bioaccumulation.

Amount used

Maximum daily site tonnage 14000 KG
Amounts used in the EU (tonnes/year) 4000 ton(s)/year
Fraction of EU tonnage used in region 0.1
Fraction of main source to local environment 0.05
Fraction of substance in end-use products 0.05

Frequency and duration of use
300 days/year Continuous

**Environment factors not influenced by risk management**

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year 300
Emission or Release Factor: Air 9.8E-01
Emission or Release Factor: Water 1E-02
Emission or Release Factor: Soil 1E-02

Remarks
Release fraction to air from process (initial release prior to RMM): 0.98
Local release to air (kg/day): 686
Release fraction to wastewater from process (initial release prior to RMM): 0.01
Local release to waste water (kg/day): 7
Release fraction to soil from wide dispersive use (Regional only): 0.01
Local release to soil (kg/day): 7

**Technical conditions and measures / Organizational measures**

Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low level continual releases.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
Prevent discharge of undissolved substance to or recover from wastewater

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent 2,000 m3/d
Percentage removed from waste water 87.4 %
Conditions and measures related to external treatment of waste for disposal

Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

Conditions and measures related to external recovery of waste

Not applicable

Other environmental control measures additional to above

None

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use)  Liquid, vapor pressure < 0.5 kPa

Concentration of the Substance in Mixture/Article  Covers the percentage of the substance in the product up to 100% (unless stated differently).

Amount used

Remarks  Not applicable.

Frequency and duration of use

Frequency of use  8 hours/day

Remarks  Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

None identified for this scenario.

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

<table>
<thead>
<tr>
<th>Contributing scenario controlling worker exposure for:</th>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS15: General exposures (closed systems)</td>
<td>Handle substance within a closed system</td>
</tr>
<tr>
<td>CS45: Filling/ preparation of equipment from drums or containers.</td>
<td>Handle substance within a closed system Use drum pumps or carefully pour from container. Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS15: General exposures (closed systems) CS38: Use in contained systems</td>
<td>Handle substance within a closed system Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS96: Preparation of material for application</td>
<td>Clear up spills immediately and dispose of waste safely. Use drum pumps or carefully pour from container. Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS95: Film formation - air drying OC9: Outdoor</td>
<td>Avoid manual contact with wet work pieces. Provide enhanced general ventilation by mechanical means. Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS95: Film formation - air drying OC8: Indoor</td>
<td>Avoid manual contact with wet work pieces. Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Provide extraction ventilation at points where emissions occur. Wear suitable gloves tested to EN374. Use suitable eye protection.</td>
</tr>
<tr>
<td>CS96: Preparation of material for application OC8: Indoor</td>
<td>Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS96: Preparation of material for application OC9: Outdoor</td>
<td>Avoid carrying out operation for more than 4 hours. or; Ensure operation is undertaken outdoors. Use suitable eye protection. Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS3: Material transfers CS8: Drum/batch transfers</td>
<td>Provide extraction ventilation at points where emissions occur.</td>
</tr>
</tbody>
</table>
Use suitable eye protection.
Wear suitable gloves tested to EN374.

CS3: Material transfers
CS8: Drum/batch transfers
Use drum pumps or carefully pour from container. Provide extraction ventilation at points where emissions occur.
Wear suitable gloves tested to EN374.
Use suitable eye protection.

CS98: Roller, spreader, flow application
OC8: Indoor
Provide enhanced general ventilation by mechanical means. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.
Wear a respirator conforming to EN140 with Type A filter or better.

CS98: Roller, spreader, flow application
OC9: Outdoor
Limit the substance content in the product to 25 %.
Ensure operation is undertaken outdoors.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

CS34: Manual Spraying
CS10: Indoor
Carry out in a vented booth or extracted enclosure. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

CS34: Manual Spraying
CS10: Outdoor
Limit the substance content in the product to 25 %.
Ensure operation is undertaken outdoors.
Wear a respirator conforming to EN140 with Type A filter or better.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

CS4: Dipping, immersion and pouring
OC8: Indoor
Avoid manual contact with wet work pieces. Clear up spills immediately and dispose of waste safely. Provide extraction ventilation at points where emissions occur.
Wear suitable gloves tested to EN374.
Use suitable eye protection.

CS4: Dipping, immersion and pouring
OC9: Outdoor
Avoid manual contact with wet work pieces. Clear up spills immediately and dispose of waste safely. Ensure operation is undertaken outdoors.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

CS36: Laboratory activities
Use suitable eye protection.
Wear suitable gloves tested to EN374.
CS72: Hand application - finger-paints, pastels, adhesives OC8: Indoor
Avoid carrying out operation for more than 1 hour.
Ensure doors and windows are opened.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

CS72: Hand application - finger-paints, pastels, adhesives OC9: Outdoor
Avoid carrying out operation for more than 1 hour.
Ensure operation is undertaken outdoors.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Use suitable eye protection.

Section 3: Exposure estimation and reference to its source

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.

Environment
No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment
Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title
Use in Coatings

Use Descriptors

Sector of use:
SU21: Private households (=general public = consumers)

Product category:
PC9a: Coatings and paints, thinners, paint removers

Process category:
: Not applicable.
Environmental release category:
ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems

Processes, tasks activities covered
Covers the use in water based coatings (paints, inks, adhesives, etc.) including exposures during use (including product transfer and preparation, application by brush, roller by hand or similar methods) and equipment cleaning.

Section 2: Operational conditions and risk management measures
Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure
Product characteristics
Physical Form (at time of use) Liquid, vapor pressure > 10 Pa
High volatile liquid
Water solubility Miscible
Biodegradability Readily biodegradable
Remarks Low potential for bioaccumulation.

Amount used
Amounts used in the EU (tonnes/year) 3000 ton(s)/year
Fraction of EU tonnage used in region 0.1

Frequency and duration of use
365 days/year

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure
Number of emission days per year  365

Technical conditions and measures / Organizational measures

None

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage   2,000 m3/d
treatment plant
effluent

Percentage removed   87 %
from waste water

Conditions and measures related to external treatment of waste for disposal

No special precautions required.

Conditions and measures related to external recovery of waste

No specific measures identified.

Other environmental control measures additional to above

No specific measures identified.

Section 2.2: Control of consumer exposure

Product characteristics

Physical Form (at time of use)   Liquid, vapor pressure > 10 Pa
                                High volatile liquid

Concentration of the Substance in Mixture/Article   Concentration of substance in product Max. 3 %

Amount used
Frequency and duration of use

Frequency of use: 4 times/year

Human factors not influenced by risk management

User can increase ventilation by opening windows during painting

Contributing scenario controlling consumer exposure for:

Coatings and paints, thinners, paint removers

Operational conditions and risk management measures

Room size: 20 m³

Remarks: Unless otherwise stated, assumes use with typical ventilation. See specific operational conditions below.

Remarks: Indoor or outdoor use at ambient temperature. Substance evaporates during drying to form a dry paint film. Substance always used neat.

Section 3: Exposure estimation and reference to its source

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.

Environment: No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health: Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Environment
Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title
Use in Cleaning Agents

Use Descriptors

Sector of use:
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC10: Roller application or brushing
PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring

Environmental release category:
ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems
ESVOC SpERC 9

Processes, tasks activities covered
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

Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) 
Liquid, vapor pressure < 0.5 kPa
**Water solubility**  Miscible

**Biodegradability**  Readily biodegradable

**Remarks**  Low potential for bioaccumulation.

### Amount used

- **Maximum daily site tonnage**  10000 KG
- **Amounts used in the EU (tonnes/year)**  3000 ton(s)/year
- **Fraction of EU tonnage used in region**  0.1
- **Fraction of main source to local environment**  0.05
- **Fraction of substance in end-use products**  0.05

### Frequency and duration of use

- **300 days/year Continuous**

### Environment factors not influenced by risk management

- **Dilution Factor (River)**  10
- **Dilution Factor (Coastal Areas)**  100

### Other given operational conditions affecting environmental exposure
Number of emission days per year  300
Emission or Release Factor: Air  2E-02
Emission or Release Factor: Water  1E-06
Emission or Release Factor: Soil  0E+00

Remarks
Release fraction to air from process (initial release prior to
RMMM): 0.02
Local release to air (kg/day): 10
Release fraction to wastewater from process (initial release
prior to RMMM): 0.000001
Release fraction to soil from process (initial release prior to
RMMM): 0
Local release to soil (kg/day): 0

Technical conditions and measures / Organizational measures

Site should have a spill plan to ensure that adequate safeguards are in place to
minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low level continual releases.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent 2,000 m3/d
Percentage removed from waste water 87.4 %

Conditions and measures related to external treatment of waste for disposal

Dispose of waste solvent and used containers according to local regulations.
Dispose of waste product or used containers according to local regulations.

Conditions and measures related to external recovery of waste

Not applicable

Other environmental control measures additional to above
No specific measures identified.

Section 2.2: Control of worker exposure

Product characteristics

Physical Form (at time of use)  Liquid, vapor pressure < 0.5 kPa

Concentration of the Substance in Mixture/Article  Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Amount used

Remarks  Not applicable.

Frequency and duration of use

Frequency of use  8 hours/day

Remarks  Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

None identified for this scenario.

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenario controlling worker exposure for:

<table>
<thead>
<tr>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS45: Filling/ preparation of equipment from drums or containers.</td>
</tr>
<tr>
<td>Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.</td>
</tr>
<tr>
<td>Use suitable eye protection.</td>
</tr>
<tr>
<td>Wear suitable gloves tested to EN374.</td>
</tr>
<tr>
<td>CS39: Equipment cleaning</td>
</tr>
<tr>
<td>No specific measures identified.</td>
</tr>
</tbody>
</table>

SANITARY DATA SHEET

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

GLYCOL ETHER EB

Gen. Variant: SDS_GB

Version 1.4  Revision Date 02/26/2016  Print Date 11/07/2016  SDS No.: 3396

LYONDEL/LBALISEL
and maintenance CS38: Use in contained systems

CS76: Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Use suitable eye protection. Wear suitable gloves tested to EN374.

CS45: Filling/ preparation of equipment from drums or containers.

Avoid carrying out operation for more than 4 hours. Ensure operation is undertaken outdoors. Wear suitable gloves tested to EN374. or; Use suitable eye protection.

CS34: Manual CS48: Surfaces CS47: Cleaning CS4: Dipping, immersion and pouring

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Use suitable eye protection. Wear suitable gloves tested to EN374.

CS42: Cleaning with low-pressure washers CS51: Rolling, Brushing CS60: no spraying

Limit the substance content in the product to 25 %. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Use suitable eye protection. Wear suitable gloves tested to EN374.

CS44: Cleaning with high pressure washers CS10: Spraying OC8: Indoor

Limit the substance content in the product to 5 %. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Wear suitable gloves tested to EN374. Use suitable eye protection.

CS44: Cleaning with high pressure washers CS10: Spraying OC9: Outdoor

Limit the substance content in the product to 5 %. or; Ensure operation is undertaken outdoors. Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

CS34: Manual CS48: Surfaces CS47: Cleaning CS10: Spraying

Limit the substance content in the product to 25 %. Ensure doors and windows are opened. Use suitable eye protection. Wear suitable gloves tested to EN374.

CS27: Ad hoc manual application via trigger sprays, dipping, etc. CS51: Rolling, Brushing

Limit the substance content in the product to 25 %. Ensure doors and windows are opened. Wear suitable gloves tested to EN374. Use suitable eye protection.
CS101: Application of cleaning products in closed systems
OC9: Outdoor

Ensure operation is undertaken outdoors.
Wear suitable gloves tested to EN374.
Use suitable eye protection.

Section 3: Exposure estimation and reference to its source

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.

Environment
No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment
Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title
Use in Cleaning Agents

Use Descriptors

Sector of use:
SU21: Private households (=general public = consumers)

Product category:
PC35: Washing and cleaning products (including solvent based products)

Process category:
: Not applicable.

Environmental release category:
ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems

Processes, tasks activities covered
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products.
Covers liquid cleaners (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners), and trigger spray cleaners (all purpose cleaners, sanitary products, glass cleaners).
Section 2: Operational conditions and risk management measures

Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.

Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use) Liquid, vapor pressure > 10 Pa
High volatile liquid

Water solubility Miscible

Biodegradability Readily biodegradable

Remarks Low potential for bioaccumulation.

Amount used

Amounts used in the EU (tonnes/year) 1000 ton(s/year)

Fraction of EU tonnage used in region 0.1

Frequency and duration of use

365 days/year

Environment factors not influenced by risk management

Remarks Not Applicable.

Other given operational conditions affecting environmental exposure

Number of emission days per year 300

Technical conditions and measures / Organizational measures

None

Conditions and measures related to municipal sewage treatment plant

55 / 63
Flow rate of sewage treatment plant effluent

Percentage removed from waste water 87 %

Conditions and measures related to external treatment of waste for disposal

No special precautions required.

Conditions and measures related to external recovery of waste

No specific measures identified.

Other environmental control measures additional to above

No specific measures identified.

Section 2.2: Control of consumer exposure

Product characteristics

Physical Form (at time of use) Liquid, vapor pressure > 10 Pa
High volatile liquid

Concentration of the Substance in Mixture/Article Concentration of substance in product up to 7%

Amount used 35 g/event

Frequency and duration of use

Frequency of use 10 minutes/day

Remarks (trigger sprays)
20 minutes/day

(other)

Human factors not influenced by risk management

None identified for this scenario.

Indoor or outdoor use at ambient temperature. Substance evaporates during drying to form a dry paint film. Substance evaporates during drying.

Contributing scenario controlling consumer exposure for:

Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)

Operational conditions and risk management measures

Room size 20 m3

Ventilation rate per hour 0.6

Remarks: No specific measures identified.

Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

Operational conditions and risk management measures

Room size 20 m3

Ventilation rate per hour 0.6

Remarks: No specific measures identified.

Section 3: Exposure estimation and reference to its source

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.
Environment

No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment

Not applicable for wide dispersive uses.

Section 1: Title of Exposure Scenario

Short title

Use in Oil and Gas field drilling and production operations

Use Descriptors

Sector of use:

SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process category:

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at dedicated facilities

Environmental release category:

ERC8d: Wide dispersive outdoor use of processing aids in open systems

Processes, tasks activities covered

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

Colorless liquid with relatively low Vapour pressure.
It is readily absorbed through the skin.
Low potential for bioaccumulation.
Section 2.1: Control of environmental exposure

Product characteristics

Physical Form (at time of use)  Liquid, vapor pressure < 0.5 kPa
Water solubility               Miscible

Biodegradability            Readily biodegradable

Remarks                      Low potential for bioaccumulation.

Amount used

Maximum daily site tonnage     500 KG
Amounts used in the EU (tonnes/year) 500 ton(s)/year
Fraction of EU tonnage used in region 0.1
Fraction of main source to local environment 0.3
Fraction of substance in end-use products 0.25

Frequency and duration of use

30 days/year Batch process

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure
Number of emission days per year 30

Emission or Release Factor: Air 5E-03

Emission or Release Factor: Water 7E-02

Emission or Release Factor: Soil 0E+00

Remarks
Release fraction to air from process (initial release prior to RMMM): 0.005
Local release to air (kg/day): 2.5
Release fraction to wastewater from wide dispersive use (Regional only): 0.07
Local release to waste water (kg/day): 35
Release fraction to soil from process (initial release prior to RMMM): 0
Local release to soil (kg/day): 0

Technical conditions and measures / Organizational measures

Treatment of air emissions is not required for the purposes of REACh compliance but may be needed to comply with other environmental legislation.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ 87%
Soil emission controls are not applicable as there is no direct release to soil.
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low level continual releases.
Bund storage facilities to prevent soil and water pollution in the event of spillage.
Prevent environmental discharge consistent with regulatory requirements.
Prevent discharge of undissolved substance to or recover from wastewater

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent 2,000 m3/d
Percentage removed from waste water 87.4 %

Conditions and measures related to external treatment of waste for disposal

Estimated amount entering waste treatment no greater than 90 %.
Type of treatment suitable for waste: incineration. Removal efficiency 99.98 %.
Type of treatment suitable for waste: biological treatment.
External treatment and disposal of waste should comply with applicable local and/or national regulations. Dispose of waste product or used containers according to local regulations.

**Conditions and measures related to external recovery of waste**

Not applicable

**Other environmental control measures additional to above**

No specific measures identified.

**Section 2.2: Control of worker exposure**

**Product characteristics**

**Physical Form (at time of use)**  Liquid, vapor pressure < 0.5 kPa

**Concentration of the Substance in Mixture/Article**  Covers the percentage of the substance in the product up to 100 % (unless stated differently).

**Amount used**

**Remarks**  Not applicable.

**Frequency and duration of use**

**Frequency of use**  12 hours/day

**Remarks**  Covers daily exposures up to 12 hours (unless stated differently).

**Human factors not influenced by risk management**

None identified for this scenario.

**Other operational conditions affecting workers exposure**

Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented.
Contributing scenario controlling worker exposure for:

- Risk management measures common to all scenarios.

Risk Management Measures

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 skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin effects that may develop.

CS114: Bulk transfers from tote tanks and supply vessels
- Use suitable eye protection.

CS45: Filling/ preparation of equipment from drums or containers.
- Use suitable eye protection.

CS115: Drilling mud (re-)formulation
- Use suitable eye protection.

CS116: Drill floor operations
- Use suitable eye protection.

CS117: Operation of solids filtering equipment CS111: Elevated temperature. (up to 80 C)
- Provide extraction ventilation at points where emissions occur.
- Use suitable eye protection.

CS117: Operation of solids filtering equipment CS138: With potential for aerosol generation
- Use suitable eye protection.

CS121: Treatment and disposal of filtered solids
- Use suitable eye protection.

CS2: Process sampling
- Use suitable eye protection.

CSL11: In line injection of process chemicals by fixed dose pumping.
- No other specific measures identified.

- Application of process chemicals by pouring from a jug into systems.
- Use suitable eye protection.

CS39: Equipment cleaning
- Provide extraction ventilation at points where emissions
and maintenance occur.
Use suitable eye protection.

CS15: General exposures
(closed systems)
Use suitable eye protection.

Section 3: Exposure estimation and reference to its source

**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.

**Environment**
No additional information detailed.

Section 4: Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

**Health**
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Environment**
Not applicable for wide dispersive uses.