

This safety data sheet was created pursuant to the requirements of:  
UK REACH Regulations (SI 2019/758 as amended)

**Supersedes date** 08-May-2019

**Revision date** 23-Jun-2026

**Revision Number** 3

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

### **1.1. Product identifier**

|                                 |                                         |
|---------------------------------|-----------------------------------------|
| <b>Product Code(s)</b>          | 00509                                   |
| <b>Safety data sheet number</b> | 00509                                   |
| <b>Product Name</b>             | 2-DIMETHYLAMINOETHANOL                  |
| <b>Index No</b>                 | 603-047-00-0                            |
| <b>EC Number</b>                | 203-542-8                               |
| <b>CAS No</b>                   | 108-01-0                                |
| <b>Synonyms</b>                 | DMAE, AMIETOL M21, DIMETHYLETHANOLAMINE |
| <b>Pure substance/mixture</b>   | Substance                               |
| Contains 2-DIMETHYLAMINOETHANOL |                                         |
| <b>Molecular weight</b>         | 89.14 g/mol                             |

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

|                             |                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Recommended use</b>      | Industrial application<br>Chemical intermediate<br>For further information, see attached Exposure Scenario |
| <b>Uses advised against</b> | Cosmetics<br>Food additive                                                                                 |

### **1.3. Details of the supplier of the safety data sheet**

#### **Supplier**

Univar Solutions UK Ltd  
Aquarius House  
6 Mid Point Business Park  
Bradford  
GBR

For further information, please contact

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| <b>E-mail address</b>                 | SDS.EMEA@univarsolutions.com      |
| <b>Non-Emergency Telephone Number</b> | +44 1274 267300 / +44 1274 267306 |

### **1.4. Emergency telephone number**

|                            |                                |
|----------------------------|--------------------------------|
| <b>Emergency Telephone</b> | SGS - +32 (0)3 575 55 55 (24h) |
|----------------------------|--------------------------------|

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

|                                                  |                                    |
|--------------------------------------------------|------------------------------------|
| Flammable liquids                                | Category 3 - (H226)                |
| Acute toxicity - Oral                            | Category 4 - (H302)                |
| Acute toxicity - Dermal                          | Category 4 - (H312)                |
| Acute toxicity - Inhalation (Vapours)            | Category 3 - (H331)                |
| Skin corrosion/irritation                        | Category 1 Sub-category B - (H314) |
| Serious eye damage/eye irritation                | Category 1 - (H318)                |
| Specific target organ toxicity — single exposure | Category 3 - (H335)                |
| Category 3 Respiratory irritation                |                                    |

### 2.2. Label elements

Contains 2-DIMETHYLAMINOETHANOL



**Signal word**  
Danger

#### Hazard statements

H302 - Harmful if swallowed  
H312 - Harmful in contact with skin  
H314 - Causes severe skin burns and eye damage  
H331 - Toxic if inhaled  
H335 - May cause respiratory irritation  
H226 - Flammable liquid and vapour

#### Precautionary statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking  
P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection  
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]  
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish  
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

#### Additional information

This product requires child resistant fastenings if supplied to the general public. This product requires tactile warnings if supplied to the general public.

### 2.3. Other hazards

In the presence of nitrosating agents, it is possible that this substance forms nitrosamines. Suspected cancer-causing nitrosamines could be formed.

**SECTION 3: Composition/information on ingredients****3.1 Substances**

| Chemical name                      | Weight-%           | EC No (EU Index No)         | UK REACH registration number | Classification according to GB CLP (SI 2020/1567 as amended)                                                                                              | Specific concentration limit (SCL) | M-Factor | M-Factor (long-term) |
|------------------------------------|--------------------|-----------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------|----------------------|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 | >= 90 -<br><= 100% | 203-542-8<br>(603-047-00-0) | -                            | Flam. Liq. 3 (H226)<br>Acute Tox. 4 (H302)<br>Acute Tox. 4 (H312)<br>Skin Corr. 1B (H314)<br>Eye Dam. 1 (H318)<br>Acute Tox. 3 (H331)<br>STOT SE 3 (H335) | STOT SE 3 ::<br>C>=5%              | -        | -                    |

**Full text of H- and EUH-phrases: see section 16**

This product does not contain candidate substances of very high concern at a concentration >= 0.1% (UK REACH Article 59)

**SECTION 4: First aid measures****4.1. Description of first aid measures**

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General advice</b>                     | Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Inhalation</b>                         | Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical attention. Immediate medical attention is required. Inhale Corticosteroid dose aerosol.            |
| <b>Eye contact</b>                        | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.                                                                                                                                                                                                                                                                                                       |
| <b>Skin contact</b>                       | Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention. Take off contaminated clothing and wash it before reuse.                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Ingestion</b>                          | Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get immediate medical attention.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Self-protection of the first aider</b> | Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Do not breathe vapour or mist. |

**4.2. Most important symptoms and effects, both acute and delayed**

|                 |                                                                                                                                                                                       |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Symptoms</b> | Burning sensation. Coughing and/ or wheezing. Difficulty in breathing. Harmful if swallowed. Harmful in contact with skin. Causes severe skin burns and eye damage. Toxic if inhaled. |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                   |                                                     |
|-------------------|-----------------------------------------------------|
|                   | May cause respiratory irritation.                   |
| <b>Inhalation</b> | Toxic if inhaled. May cause respiratory irritation. |
| <b>Eyes</b>       | Causes serious eye damage.                          |
| <b>Dermal</b>     | Causes severe burns. Harmful in contact with skin.  |
| <b>Ingestion</b>  | Harmful if swallowed                                |

#### **4.3. Indication of any immediate medical attention and special treatment needed**

|                        |                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Note to doctors</b> | Product is a corrosive material. Use of gastric lavage or emesis is contra-indicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically. |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **SECTION 5: Firefighting measures**

#### **5.1. Extinguishing media**

|                                       |                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------|
| <b>Suitable Extinguishing Media</b>   | Dry chemical. Carbon dioxide (CO <sub>2</sub> ). Water spray. Alcohol resistant foam. |
| <b>Large Fire</b>                     | CAUTION: Use of water spray when fighting fire may be inefficient.                    |
| <b>Unsuitable extinguishing media</b> | Do not scatter spilled material with high pressure water streams.                     |

#### **5.2. Special hazards arising from the substance or mixture**

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Specific hazards arising from the chemical</b> | Risk of ignition. Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours. The product will float on water and can be reignited on surface water. |
| <b>Hazardous combustion products</b>              | Carbon oxides. Nitrogen oxides (NO <sub>x</sub> ). Nitrosamines.                                                                                                                                                                                                                                                                                                                                                                                                               |

#### **5.3. Advice for firefighters**

|                                                                       |                                                                                                                                    |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Special protective equipment and precautions for fire-fighters</b> | Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment. |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|

### **SECTION 6: Accidental release measures**

#### **6.1. Personal precautions, protective equipment and emergency procedures**

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Personal precautions</b> | Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Attention! Corrosive material. Do not breathe vapour or mist. In case of inadequate ventilation wear respiratory protection. CAUTION! N-Nitrosamines, many of which are known to be potent carcinogens, may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations. |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Other information** Ventilate the area. Refer to protective measures listed in Sections 7 and 8.

**For emergency responders** Use personal protection recommended in Section 8.

### **6.2. Environmental precautions**

**Environmental precautions** Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Should not be released into the environment. Do not allow to enter into soil/subsoil. Local authorities should be advised if significant spillages cannot be contained.

### **6.3. Methods and material for containment and cleaning up**

**Methods for containment** Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapour suppressing foam may be used to reduce vapours. Dyke far ahead of spill to collect run-off water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure adequate ventilation.

**Methods for cleaning up** Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labelled containers. Wash area with detergent and water. Retain contaminated washing water and dispose of it. Collect spillage in containers, seal securely and deliver for disposal according to local regulations.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

### **6.4. Reference to other sections**

**Reference to other sections** See section 8 for more information. See section 13 for more information.

## **SECTION 7: Handling and storage**

### **7.1. Precautions for safe handling**

**Advice on safe handling** Use personal protection equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Use according to package label instructions. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse. Do not breathe vapour or mist. Ensure adequate ventilation. Vapours may form explosive mixtures with air. Take precautionary measures against static discharge. CAUTION! N-Nitrosamines, many of which are known to be potent carcinogens, may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations.

**General hygiene considerations** Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Do not breathe vapour or mist. Ensure that eyewash stations and safety showers are close to the workstation location. Handle in accordance with good industrial hygiene and safety practice. Do not clean-up or dispose of unless adequately trained to do so, or under the supervision of a specialist.

**7.2. Conditions for safe storage, including any incompatibilities****Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labelled containers. Do not store near combustible materials. Keep in an area equipped with sprinklers. Store in accordance with the particular national regulations. Store in accordance with local regulations. Keep out of the reach of children. Store locked up. Protect from moisture. Store away from other materials. Avoid contact with: Strong acids. Oxidising agents. Halogenated compounds. Isocyanates. Nitrosating agents. Acid forming substances. Acid chlorides. Acid anhydrides. Chlorides.

**7.3. Specific end use(s)****Specific use(s)**

See section 1 for more information.

**Risk Management Methods (RMM)** The information required is contained in this Safety Data Sheet.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Exposure Limits**

| Chemical name                      | United Kingdom                                                                        |
|------------------------------------|---------------------------------------------------------------------------------------|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 | TWA: 2 ppm<br>TWA: 7.4 mg/m <sup>3</sup><br>STEL: 6 ppm<br>STEL: 22 mg/m <sup>3</sup> |

**Biological occupational exposure limits**

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

**Derived No Effect Level (DNEL) - Workers**

| Chemical name                      | Oral | Dermal                                                                    | Inhalation                                                                                                                            |
|------------------------------------|------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 |      | 0.25 mg/kg [4] [6]<br>1.2 mg/kg [4] [7]<br>100 µg/cm <sup>2</sup> [5] [7] | 1.76 mg/m <sup>3</sup> [4] [6]<br>5.28 mg/m <sup>3</sup> [4] [7]<br>1.76 mg/m <sup>3</sup> [5] [6]<br>13.53 mg/m <sup>3</sup> [5] [7] |

- [4] Systemic health effects.  
 [5] Local health effects.  
 [6] Long term.  
 [7] Short term.

**Derived No Effect Level (DNEL) - General Public**

| Chemical name                      | Oral                | Dermal | Inhalation                      |
|------------------------------------|---------------------|--------|---------------------------------|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 | 0.148 mg/kg [4] [6] |        | 0.438 mg/m <sup>3</sup> [4] [6] |

- [4] Systemic health effects.  
 [6] Long term.

**Predicted No Effect Concentration (PNEC)**

| Chemical name                      | Freshwater | Freshwater (intermittent release) | Marine water | Marine water (intermittent release) | Air |
|------------------------------------|------------|-----------------------------------|--------------|-------------------------------------|-----|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 | 0.066 mg/L | 0.661 mg/L                        | 0.004 mg/L   |                                     |     |

| Chemical name                      | Freshwater sediment | Marine sediment | Sewage treatment | Soil       | Food chain |
|------------------------------------|---------------------|-----------------|------------------|------------|------------|
| 2-DIMETHYLAMINOETHANOL<br>108-01-0 | 0.246 mg/kg         | 0.015 mg/kg     | 10 mg/L          | 0.01 mg/kg |            |

**8.2. Exposure controls****Engineering controls**

Ensure adequate ventilation. Use with local exhaust ventilation. Use engineering controls to keep exposures below the OEL or DNEL. Ensure that eyewash stations and safety showers are close to the workstation location. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Personal protective equipment****Eye/face protection**

Tight sealing safety goggles. Face protection shield. Use eye protection according to EN ISO 16321-1.

**Hand protection**

Wear suitable gloves. Impervious gloves. Gloves must conform to standard EN 374. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves.

| Gloves               |                          |                 |                    |
|----------------------|--------------------------|-----------------|--------------------|
| Duration of contact  | PPE - Glove material     | Glove thickness | Break through time |
| Long term (repeated) | Butyl rubber             | 0.7 mm          | > 480 minutes      |
| Long term (repeated) | Fluoroelastomer          | 0.7 mm          | > 480 minutes      |
| Long term (repeated) | Nitrile rubber           | 0.4 mm          | > 480 minutes      |
| Short term           | Chloroprene rubber (CR)  | 0.5 mm          | > 120 minutes      |
| Short term           | Polyvinyl chloride (PVC) | 0.7 mm          | > 120 minutes      |

**Skin and body protection**

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Antistatic boots. Chemical-resistant protective suit. According to standards: EN14605.

**Respiratory protection**

In case of inadequate ventilation wear respiratory protection. Long term. Wear positive pressure self-contained breathing apparatus (SCBA). According to standards: EN 133. Filter type K. Short term. Use the following CE approved air-purifying respirator: Organic vapor cartridge, Type A (boiling point > 65 °C). According to standard EN 14387.

**General hygiene considerations**

Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Do not breathe vapour or mist. Ensure that eyewash stations and safety showers are close to

the workstation location. Handle in accordance with good industrial hygiene and safety practice. Do not clean-up or dispose of unless adequately trained to do so, or under the supervision of a specialist.

**Environmental exposure controls** Local authorities should be advised if significant spillages cannot be contained. Ensure all waste water is collected and treated via a waste water treatment plant.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|                 |                          |
|-----------------|--------------------------|
| Physical state  | Liquid                   |
| Appearance      | Liquid                   |
| Colour          | Colourless               |
| Odour           | Amine-like.              |
| Odour threshold | No information available |

| Property                                | Values                                                     | Remarks • Method          |
|-----------------------------------------|------------------------------------------------------------|---------------------------|
| Melting point / freezing point          | -59 °C                                                     | No information available. |
| Initial boiling point and boiling range | 134.1 °C                                                   | 1013 hPa.                 |
| Flammability                            |                                                            | No information available. |
| Flammability Limit in Air               |                                                            | No information available. |
| Upper flammability or explosive limits  | 12.2 %V                                                    |                           |
| Lower flammability or explosive limits  | 1.4 %V                                                     |                           |
| Flash point                             | 39 - 40 °C                                                 | Closed cup. DIN 51755.    |
| Autoignition temperature                | 230 °C                                                     | DIN 51794.                |
| Decomposition temperature               | 340 °C                                                     | No information available. |
| pH                                      | 10.5 - 11                                                  | @ 20 °C. 100 g/l.         |
| pH (as aqueous solution)                |                                                            | No information available. |
| Kinematic viscosity                     |                                                            | No information available. |
| Dynamic viscosity                       | 3.584 mPa s                                                | @ 21.6 °C.                |
| Water solubility                        | Miscible with water                                        | No information available. |
| Solubility(ies)                         |                                                            | No information available. |
| Partition coefficient                   | log Pow: -0.55                                             | @ 23 °C.                  |
| Vapour pressure                         | 10 hPa                                                     | @ 28.1 °C.                |
| Relative density                        | 0.89                                                       | @ 21.6 °C.                |
| Bulk density                            |                                                            | No information available  |
| Liquid Density                          | 0.89 g/mL                                                  | @ 21.6 °C                 |
| Relative vapour density                 | 3.03                                                       | No information available. |
| Particle characteristics                |                                                            | No information available. |
| Particle Size                           | No information available                                   |                           |
| Particle Size Distribution              | No information available                                   |                           |
| Explosive properties                    | Not considered to be explosive.                            |                           |
| Oxidising properties                    | Does not meet the criteria for classification as oxidising |                           |

### 9.2. Other information

|                  |             |
|------------------|-------------|
| Molecular weight | 89.14 g/mol |
| VOC content      | 100%        |

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

**Reactivity** Stable under normal conditions.

### 10.2. Chemical stability

**Stability** Stable under normal conditions.

**Explosion data**

**Sensitivity to mechanical impact** None.

**Sensitivity to static discharge** Yes.

**10.3. Possibility of hazardous reactions**

**Possibility of hazardous reactions** Hazardous polymerisation does not occur. Heating can release hazardous gases. Reacts with: Halogenated compounds. Oxidising agents. Acids. Chlorides.

**10.4. Conditions to avoid**

**Conditions to avoid** Heat, flames and sparks. Exposure to air or moisture over prolonged periods. Excessive heat. Take precautionary measures against static discharges. Keep under nitrogen blanket.

**10.5. Incompatible materials**

**Incompatible materials** Strong acids. Oxidising agents. Halogenated compounds. Isocyanates. Nitrosating agents. Acid forming substances. Acid chlorides. Acid anhydrides. Chlorides.

**10.6. Hazardous decomposition products**

**Hazardous decomposition products** Carbon oxides. Nitrogen oxides (NO<sub>x</sub>). Nitrosamines.

## **SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

**Information on likely routes of exposure**

**Product Information**

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inhalation</b>   | Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. Toxic if inhaled. May cause respiratory irritation. |
| <b>Eye contact</b>  | Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components). Corrosive to the eyes and may cause severe damage including blindness. May cause irreversible damage to eyes.                                                                                                                                                                                                                                                                                                           |
| <b>Skin contact</b> | Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. May be absorbed through the skin in harmful amounts. Harmful in contact with skin.                                                                                                                                                                                                                                                                                                                                        |
| <b>Ingestion</b>    | Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. Harmful if swallowed.                                           |

**Symptoms related to the physical, chemical and toxicological characteristics**

**Symptoms** Redness. Burning. May cause blindness. Coughing and/ or wheezing. Difficulty in breathing. Harmful if swallowed. Harmful in contact with skin. Causes severe skin burns and eye

damage. Toxic if inhaled. May cause respiratory irritation.

### Acute toxicity

#### Numerical measures of toxicity

#### Component Information

| Chemical name          | Oral LD50        | Dermal LD50         | Inhalation LC50             |
|------------------------|------------------|---------------------|-----------------------------|
| 2-DIMETHYLAMINOETHANOL | 1182 mg/kg (Rat) | 1219 mg/kg (Rabbit) | 6 mg/L (Rat) (4 h) (Vapour) |

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Skin corrosion/irritation** Classification based on data available for ingredients. Causes severe skin burns and eye damage.

#### 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method   | Species | Exposure route | Effective dose | Exposure time           | Results             |
|----------|---------|----------------|----------------|-------------------------|---------------------|
| OECD 404 | Rabbit  | Dermal         |                | > 3 minutes To < 1 hour | Causes severe burns |

**Serious eye damage/eye irritation** Classification based on data available for ingredients. Causes serious eye damage. Causes burns.

#### 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method   | Species | Exposure route | Effective dose | Exposure time | Results                   |
|----------|---------|----------------|----------------|---------------|---------------------------|
| OECD 405 | Rabbit  | eye            |                |               | Causes serious eye damage |

**Respiratory or skin sensitisation** No information available.

#### 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method   | Species    | Exposure route | Results        |
|----------|------------|----------------|----------------|
| OECD 406 | Guinea pig | Dermal         | Not classified |
|          | Mouse      | Dermal         | Not classified |

**Germ cell mutagenicity** Based on available data the classification criteria are not met.

#### Component Information

#### 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method | Species  | Results                                                       |
|--------|----------|---------------------------------------------------------------|
|        | in vitro | Negative                                                      |
|        |          | Negative Did not show mutagenic effects in animal experiments |

**Carcinogenicity** Based on available data the classification criteria are not met. CAUTION! N-Nitrosamines, many of which are known to be potent carcinogens, may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations.

#### Component Information

#### 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method | Species      | Results        |
|--------|--------------|----------------|
|        | Animal Data. | Not classified |

**Reproductive toxicity**

Based on available data the classification criteria are not met.

## 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method | Species | Results                                                                                                    |
|--------|---------|------------------------------------------------------------------------------------------------------------|
|        |         | In animal studies, did not interfere with reproduction In animal studies, did not interfere with fertility |

**STOT - single exposure**

May cause respiratory irritation.

## 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method | Species | Exposure route | Effective dose | Exposure time | Results                          |
|--------|---------|----------------|----------------|---------------|----------------------------------|
|        |         | Inhalation     |                |               | May cause respiratory irritation |

**STOT - repeated exposure**

Based on available data the classification criteria are not met.

## Component Information

## 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method | Species | Exposure route | Effective dose | Exposure time | Results                                                                                                                                                                                                                    |
|--------|---------|----------------|----------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |         |                |                |               | In humans, symptoms may include:<br>Convulsions, shock.<br>Insomnia. In animals, effects have been reported on the following organs: Blood eye respiratory tract<br>Observations in humans include:<br>Convulsions, shock. |

**Aspiration hazard**

No information available.

**Other adverse effects**

No information available.

**SECTION 12: Ecological information****12.1. Toxicity****Ecotoxicity**

The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

## 2-DIMETHYLAMINOETHANOL (108-01-0)

| Method    | Species | Endpoint type | Effective dose | Exposure time | Results        |
|-----------|---------|---------------|----------------|---------------|----------------|
| DIN 38412 | Fish    | LC50          | > 100 mg/L     | 96 hours      | Not classified |

|                 |           |       |            |          |                         |
|-----------------|-----------|-------|------------|----------|-------------------------|
| 79/831/EEC, C.2 | Crustacea | EC50  | 98.37 mg/L | 48 hours | Harmful to aquatic life |
|                 | Algae     | ErC50 | 66.08 mg/L | 72 hours | Harmful to aquatic life |
| QSAR            | Fish      | NOEC  | > 1 mg/L   |          | Not classified          |
| QSAR            | Crustacea | NOEC  | > 1 mg/L   |          | Not classified          |
|                 | Algae     | ErC10 | > 1 mg/L   | 72 hours | Not classified          |

**12.2. Persistence and degradability**

**Persistence and degradability** Readily biodegradable.

**2-DIMETHYLAMINOETHANOL (108-01-0)**

| Method                                                                        | Exposure time | Value                 | Results               |
|-------------------------------------------------------------------------------|---------------|-----------------------|-----------------------|
| OECD Test No. 301C: Ready Biodegradability: Modified MITI Test (I) (TG 301 C) | 14 days       | Biodegradation 60.5 % | Readily biodegradable |

**12.3. Bioaccumulative potential**

**Bioaccumulation** Not likely to bioaccumulate.

**Component Information**

| Chemical name          | Partition coefficient |
|------------------------|-----------------------|
| 2-DIMETHYLAMINOETHANOL | -0.55                 |

**12.4. Mobility in soil**

**Mobility in soil** Will not evaporate. Adsorption to solid soil phase is not expected.

**12.5. Results of PBT and vPvB assessment**

**PBT and vPvB assessment** The product does not contain any substance(s) classified as PBT or vPvB.

| Chemical name          | PBT and vPvB assessment         |
|------------------------|---------------------------------|
| 2-DIMETHYLAMINOETHANOL | The substance is not PBT / vPvB |

**12.6. Other adverse effects**

No information available.

**SECTION 13: Disposal considerations****13.1. Waste treatment methods**

**Waste from residues/unused products** Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation. Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

**Contaminated packaging** Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

**SECTION 14: Transport information****IATA**

|                                   |                        |
|-----------------------------------|------------------------|
| 14.1 UN number or ID number       | UN2051                 |
| 14.2 UN proper shipping name      | 2-DIMETHYLAMINOETHANOL |
| 14.3 Transport hazard class(es)   | 8                      |
| Subsidiary hazard class           | 3                      |
| 14.4 Packing group                | II                     |
| 14.5 Environmental hazards        | No                     |
| 14.6 Special precautions for user |                        |
| Special Provisions                | None                   |
| ERG Code                          | 8F                     |

**IMDG**

|                                                              |                          |
|--------------------------------------------------------------|--------------------------|
| 14.1 UN number or ID number                                  | UN2051                   |
| 14.2 UN proper shipping name                                 | 2-DIMETHYLAMINOETHANOL   |
| 14.3 Transport hazard class(es)                              | 8                        |
| Subsidiary hazard class                                      | 3                        |
| 14.4 Packing group                                           | II                       |
| 14.5 Environmental hazards                                   | No                       |
| 14.6 Special precautions for user                            |                          |
| Special Provisions                                           | None                     |
| EmS-No                                                       | F-E, S-C                 |
| 14.7 Maritime transport in bulk according to IMO instruments | No information available |

**RID**

|                                   |                        |
|-----------------------------------|------------------------|
| 14.1 UN number or ID number       | UN2051                 |
| 14.2 UN proper shipping name      | 2-DIMETHYLAMINOETHANOL |
| 14.3 Transport hazard class(es)   | 8                      |
| Subsidiary hazard class           | 3                      |
| 14.4 Packing group                | II                     |
| 14.5 Environmental hazards        | No                     |
| 14.6 Special precautions for user |                        |
| Special Provisions                | None                   |
| Classification code               | CF1                    |

**ADR**

|                                   |                         |
|-----------------------------------|-------------------------|
| 14.1 UN number or ID number       | UN2051                  |
| 14.2 UN proper shipping name      | 2-DIMETHYLAMINO-ETHANOL |
| 14.3 Transport hazard class(es)   | 8                       |
| Subsidiary hazard class           | 3                       |
| 14.4 Packing group                | II                      |
| 14.5 Environmental hazards        | No                      |
| 14.6 Special precautions for user |                         |
| Special Provisions                | None                    |
| Classification code               | CF1                     |
| Tunnel restriction code           | (D/E)                   |

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****National regulations****Authorisations and/or restrictions on use:**

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

This product does not contain substances subject to authorisation (UK REACH - Annex XIV).

**Product restricted per REACH Annex XVII:** 3, 40, 75

| Chemical name                     | Restricted substance per REACH Annex XVII | Substance subject to authorisation per REACH Annex XIV |
|-----------------------------------|-------------------------------------------|--------------------------------------------------------|
| 2-DIMETHYLAMINOETHANOL - 108-01-0 | 3, 40, 75.                                | -                                                      |

**Persistent Organic Pollutants**

Not applicable

**Export Notification requirements**

Not applicable

**Dangerous substance category per COMAH Regulations 2015 (as amended)**

H2 - ACUTE TOXIC

P5c - FLAMMABLE LIQUIDS

**Named dangerous substances per COMAH Regulations 2015 (as amended)**

Not applicable

**The Ozone-Depleting Substances Regulations 2015**

Not applicable

**The Biocidal Products Regulations 2001 (as amended)**

Not applicable

**The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)**

Not applicable

**Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)**

Not applicable

**International Inventories****TSCA**

Contact supplier for inventory compliance status

**DSL/NDL**

Contact supplier for inventory compliance status

**EINECS/ELINCS**

Contact supplier for inventory compliance status

**ENCS**

Contact supplier for inventory compliance status

**IECSC**

Contact supplier for inventory compliance status

**KECI**

Contact supplier for inventory compliance status

**PICCS**

Contact supplier for inventory compliance status

**AIIC**

Contact supplier for inventory compliance status

**NZIoC**

Contact supplier for inventory compliance status

**Legend:****TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory**DSL/NDL** - Canadian Domestic Substances List/Non-Domestic Substances List**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances**ENCS** - Japan Existing and New Chemical Substances**IECSC** - China Inventory of Existing Chemical Substances**KECL** - Korean Existing and Evaluated Chemical Substances**PICCS** - Philippines Inventory of Chemicals and Chemical Substances**AIIC** - Australian Inventory of Industrial Chemicals**NZIoC** - New Zealand Inventory of Chemicals**15.2. Chemical safety assessment****Chemical Safety Report**

A Chemical Safety Assessment has been carried out for this substance

**SECTION 16: Other information****Key or legend to abbreviations and acronyms used in the safety data sheet**

Full text of H-Statements referred to under section 3

H226 - Flammable liquid and vapour  
H302 - Harmful if swallowed  
H312 - Harmful in contact with skin  
H314 - Causes severe skin burns and eye damage  
H318 - Causes serious eye damage  
H331 - Toxic if inhaled  
H335 - May cause respiratory irritation

**Legend**

SVHC: Substances of Very High Concern for Authorisation:

**Legend Section 8: Exposure controls/personal protection**

|         |                             |      |                                  |
|---------|-----------------------------|------|----------------------------------|
| TWA     | TWA (time-weighted average) | STEL | STEL (Short Term Exposure Limit) |
| Ceiling | Maximum limit value         | *    | Skin designation                 |
| +       | Sensitisers                 |      |                                  |

Revision Note **SDS sections updated 1 2 3 4 5 6 7 8 9 10 11 12 13 15 16**

**Classification procedure**

|                                                                 |                       |
|-----------------------------------------------------------------|-----------------------|
| Classification according to Regulation (EC) No. 1272/2008 [CLP] | Method Used           |
| Acute oral toxicity                                             | On basis of test data |
| Acute dermal toxicity                                           | On basis of test data |
| Acute inhalation toxicity - gas                                 | Calculation method    |
| Acute inhalation toxicity - vapour                              | On basis of test data |
| Acute inhalation toxicity - dust/mist                           | Calculation method    |
| Skin corrosion/irritation                                       | On basis of test data |
| Serious eye damage/eye irritation                               | On basis of test data |
| Respiratory sensitisation                                       | Calculation method    |
| Skin sensitisation                                              | On basis of test data |
| Mutagenicity                                                    | On basis of test data |
| Carcinogenicity                                                 | On basis of test data |
| Reproductive toxicity                                           | On basis of test data |
| STOT - single exposure                                          | Calculation method    |
| STOT - repeated exposure                                        | On basis of test data |
| Acute aquatic toxicity                                          | On basis of test data |
| Chronic aquatic toxicity                                        | On basis of test data |
| Aspiration hazard                                               | Calculation method    |
| Ozone                                                           | Calculation method    |

**Key literature references and sources for data used to compile the SDS**

Agency for Toxic Substances and Disease Registry (ATSDR)  
U.S. Environmental Protection Agency ChemView Database  
European Food Safety Authority (EFSA)  
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA\_RAC)  
European Chemicals Agency (ECHA) (ECHA\_API)  
Environmental Protection Agency  
Acute Exposure Guideline Level(s) (AEGL(s))  
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act  
U.S. Environmental Protection Agency High Production Volume Chemicals  
Food Research Journal  
Hazardous Substance Database  
International Uniform Chemical Information Database (IUCLID)  
National Institute of Technology and Evaluation (NITE)  
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)  
NIOSH (National Institute for Occupational Safety and Health)  
National Library of Medicine's ChemID Plus (NLM CIP)  
National Library of Medicine's PubMed database (NLM PUBMED)  
U.S. National Toxicology Program (NTP)  
New Zealand's Chemical Classification and Information Database (CCID)  
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications  
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme  
Organisation for Economic Co-operation and Development Screening Information Data Set  
World Health Organization

Prepared By N Bajaj  
Supersedes date 08-May-2019  
Revision date 23-Jun-2026

This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)  
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

**Disclaimer**

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.

**End of Safety Data Sheet**

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Manufacture of substance  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC1 - Manufacture of substances  
**Process category(ies)** 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  
  
**Sector(s) of use** SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC1 - Manufacture of substances

#### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 45000               |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 150000             |
| Units | kg/d                  |

#### Product characteristics

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
| Vapour pressure          | 10 hPa |

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

|                                  |            |
|----------------------------------|------------|
| Type                             | Onsite STP |
| Assumed on-site sewage treatment | 2000 m3/d  |

|                  |                                             |
|------------------|---------------------------------------------|
| plant flow       |                                             |
| Sludge treatment | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

|                                                                                        |                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control of worker exposure</b>                                                      |                                                                                                                                                                                                                                                                                              |
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                     |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                       |
| Vapour pressure                                                                        | 100 hPa                                                                                                                                                                                                                                                                                      |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                            |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Use with local exhaust ventilation<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Ensure that direct skin contact is avoided                               |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                                                                                                |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                            |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                   |
| Assumes process temperature up to                                                      | <= 160°C                                                                                                                                                                                                                                                                                     |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 1000 m3                                                                                                                                                                                                                                                                                                                                                      |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC3 - Use in closed batch process (synthesis or formulation)                                                                                                                                                                                                                                                                                                 |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 1000 m3                                                                                                                                                                                                                                                                                                                                                      |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 90%<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                           |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 1 hour                                                                                                                                                                                                                                                                                          |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 95%<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                           |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 90%<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                           |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3 |
|-------------------------------------------------------------------------------|-----|

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC15 - Use as laboratory reagent                                                                                                                                                                                                                                                                                                                             |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better Efficiency of at least 90%<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                           |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |

|                                                                               |         |
|-------------------------------------------------------------------------------|---------|
| Assumes process temperature up to                                             | <= 40°C |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3     |

### Section 3 - Exposure estimation

#### Environmental release category(ies) - ERC1 - Manufacture of substances

##### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

##### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.00621 mg/l             | 0.094                             |
| Freshwater sediment         | 0.023 mg/kg d.w.         | 0.094                             |
| Marine water                | 0.000618 mg/l            | 0.155                             |
| Marine sediment             | 0.0023 mg/kg d.w.        | 0.153                             |
| STP: Sewage Treatment Plant | 0.06 mg/l                | < 0.01                            |
| Soil                        | 0.0002 mg/kg d.w.        | 0.02                              |

##### Derived No Effect Level (DNEL):

|                                             |             |
|---------------------------------------------|-------------|
| Worker - dermal, long-term - systemic       | 0.25 mg/kg  |
| Worker - dermal, short-term - local         | 100 µg/cm2  |
| Worker - dermal, short-term - systemic      | 1.2 mg/kg   |
| Worker - inhalative, long-term - local      | 1.76 mg/m³  |
| Worker - inhalative, long-term - systemic   | 1.76 mg/m³  |
| Worker - inhalative, short-term - local     | 13.53 mg/m³ |
| Worker - inhalative, short-term - systemic  | 5.28 mg/m³  |
| Consumer - oral, long-term - systemic       | 0.148 mg/kg |
| Consumer - inhalative, long-term - systemic | 0.438 mg/m³ |

##### Calculation method Used ECETOC TRA model Used ART model

| Process category(ies)                                    | Exposure route                             | predicted exposure level | Risk characterisation ratio (RCR) |
|----------------------------------------------------------|--------------------------------------------|--------------------------|-----------------------------------|
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - systemic  | 0.037 mg/m³              | 0.021                             |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - systemic | 0.149 mg/m³              | 0.028                             |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - local     | 0.037 mg/m³              | 0.021                             |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - local    | 0.149 mg/m³              | 0.011                             |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, long-term - systemic      | 0.0017 mg/kg bw/d        | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, long-term -               | 0.000496 mg/cm2          |                                   |

|                                                                                          |                                            |                         |        |
|------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|--------|
| likelihood of exposure                                                                   | local                                      |                         |        |
| PROC1 - Use in closed process, no likelihood of exposure                                 | Worker - dermal, short-term - local        | 0.000496 mg/cm2         | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                                 | Worker - combined, long-term - systemic    |                         | 0.028  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - inhalative, long-term - systemic  | 0.94 mg/m <sup>3</sup>  | 0.534  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - inhalative, short-term - systemic | 3.76 mg/m <sup>3</sup>  | 0.712  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - inhalative, short-term - local    | 3.76 mg/m <sup>3</sup>  | 0.278  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - inhalative, long-term - local     | 0.94 mg/m <sup>3</sup>  | 0.534  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, long-term - systemic      | 0.004 mg/kg bw/d        | 0.04   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, short-term - local        | 0.004 mg/m <sup>3</sup> | < 0.01 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, long-term - local         | 0.004 mg/m <sup>3</sup> |        |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - combined, long-term - systemic    |                         | 0.644  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, long-term - systemic  | 0.94 mg/m <sup>3</sup>  | 0.534  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - systemic | 3.76 mg/m <sup>3</sup>  | 0.712  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - local    | 3.76 mg/m <sup>3</sup>  | 0.278  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, long-term - local     | 0.94 mg/m <sup>3</sup>  | 0.534  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - systemic      | 0.034 mg/kg bw/d        | 0.138  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, short-term - local        | 0.01 mg/m <sup>3</sup>  | 0.101  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - local         | 0.01 mg/m <sup>3</sup>  |        |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - combined, long-term - systemic    |                         | 0.672  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - systemic  | 0.446 mg/m <sup>3</sup> | 0.253  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup> | 0.563  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup> | 0.22   |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - local     | 0.446 mg/m <sup>3</sup> | 0.253  |
| PROC4 - Use in batch and other                                                           | Worker - dermal, long-term -               | 0.082 mg/kg bw/d        | 0.328  |

|                                                                                                                                   |                                            |                         |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| process (synthesis) where opportunity for exposure arises                                                                         | systemic                                   |                         |       |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - dermal, short-term - local        | 0.012 mg/m <sup>3</sup> | 0.12  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - dermal, long-term - local         | 0.012 mg/m <sup>3</sup> |       |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - combined, long-term - systemic    |                         | 0.581 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - systemic  | 0.085 mg/m <sup>3</sup> | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - systemic | 2.8 mg/m <sup>3</sup>   | 0.53  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - local    | 2.8 mg/m <sup>3</sup>   | 0.207 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - local     | 0.085 mg/m <sup>3</sup> | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic      | 0.16 mg/kg bw/d         | 0.64  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/m <sup>3</sup> | 0.12  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/m <sup>3</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.688 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.21 mg/m <sup>3</sup>  | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 1.64 mg/m <sup>3</sup>  | 0.311 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 1.64 mg/m <sup>3</sup>  | 0.121 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - local     | 0.21 mg/m <sup>3</sup>  | 0.119 |

|                                                                                                                               |                                            |                           |       |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------|-------|
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - systemic      | 0.16 mg/kg bw/d           | 0.64  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term - local        | 0.12 mg/m <sup>3</sup>    | 0.12  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - local         | 0.12 mg/m <sup>3</sup>    |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                           | 0.759 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - systemic  | 0.35 mg/m <sup>3</sup>    | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - systemic | 2.76 mg/m <sup>3</sup>    | 0.523 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - local    | 2.76 mg/m <sup>3</sup>    | 0.204 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - local     | 0.35 mg/m <sup>3</sup>    | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - systemic      | 0.08 mg/kg bw/d           | 0.32  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, short-term - local        | 0.012 mg/m <sup>3</sup>   | 0.12  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - local         | 0.012 mg/m <sup>3</sup>   |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - combined, long-term - systemic    |                           | 0.519 |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - inhalative, long-term - systemic  | 0.233 mg/m <sup>3</sup>   | 0.127 |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup>   | 0.281 |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup>   | 0.11  |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - inhalative, long-term - local     | 0.233 mg/m <sup>3</sup>   | 0.127 |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - dermal, long-term - systemic      | 0.01 mg/kg bw/d           | 0.041 |
| PROC15 - Use as laboratory reagent                                                                                            | Worker - dermal, short-term -              | 0.00298 mg/m <sup>3</sup> | 0.03  |

|                                    |                                            |                           |       |
|------------------------------------|--------------------------------------------|---------------------------|-------|
|                                    | local                                      |                           |       |
| PROC15 - Use as laboratory reagent | Worker - dermal, long-term -<br>local      | 0.00298 mg/m <sup>3</sup> |       |
| PROC15 - Use as laboratory reagent | Worker - combined, long-term<br>- systemic |                           | 0.167 |

#### Section 4 - Guidance to check compliance with the exposure scenario

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Formulation & (re)packing of substances and mixtures  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC2 - Formulation of preparations (mixtures)  
**Process category(ies)** 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 (multi-stage 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)  
 PROC15 - Use as laboratory reagent  
**Product category(ies)** PC9a - Coatings and paints, thinners, paint removers PC16 - Heat transfer fluids PC17 - Hydraulic fluids PC18 - Ink and toners PC24 - Lubricants, greases, release products PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids PC32 - Polymer preparations and compounds  
**Sector(s) of use** SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC2 - Formulation of preparations (mixtures)

##### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 35000               |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 116600             |
| Units | kg/d                  |

##### Product characteristics

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
|--------------------------|--------|

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

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Type                                        | Onsite STP                                  |
| Assumed on-site sewage treatment plant flow | 2000 m3/d                                   |
| Sludge treatment                            | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

**Control of worker exposure**

|                                                                                        |                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                     |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                       |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                     |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                            |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source                                                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%<br>Wear suitable face shield<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Use suitable eye protection                   |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                            |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                   |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                      |

|                                                                                        |                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                   |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                     |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                          |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                 |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area                                                                                 |

|                                                                         |                                                                                                                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report | Avoid contact with contaminated tools and objects                                                                                                                |
| Indoor/Outdoor use                                                      | Indoor use                                                                                                                                                       |
| Assumes process temperature up to                                       | <= 40°C                                                                                                                                                          |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC3 - Use in closed batch process (synthesis or formulation)                                                                                                                                                                                                             |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                     |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                   |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                       |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                          |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                       |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% |
| Organisational measures to prevent /limit releases, dispersion and                     | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented                                                                                                                                                |

|                                                                         |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| exposure                                                                | Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report | Avoid contact with contaminated tools and objects                                                                                                                                                                               |
| Indoor/Outdoor use                                                      | Indoor use                                                                                                                                                                                                                      |
| Assumes process temperature up to                                       | <= 40°C                                                                                                                                                                                                                         |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 30%                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 98%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

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|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                   |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                               |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                             |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                 |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                               |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                    |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) |
| Conditions and measures related to personal protection, hygiene and                    | Wear suitable face shield<br>Use suitable eye protection                                                                                                                                                                             |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| health evaluation                                                           | Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 98%                                                                                                                                                 |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out operation for more than 1 hour                                                                                                                                                                                                                                                                                                              |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                             |                                                                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)       | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities |
| Covers concentrations up to | 5%                                                                                                                                |
| Physical form of product    | Liquid                                                                                                                            |
| Use frequency               | Covers daily exposures up to 8 hours (unless stated differently).                                                                 |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

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|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                               |          |
|-------------------------------------------------------------------------------|----------|
| Use in room with a volume of minimum                                          | > 300 m3 |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3      |

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|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |

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|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                           |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                      |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                    |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                    |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                         |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98% |
| Organisational measures to prevent /limit releases, dispersion and                     | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented                                                                                                                                                               |

|                                                                               |                                                                                                                                                                                                                                 |
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| exposure                                                                      | Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report       | Avoid contact with contaminated tools and objects                                                                                                                                                                               |
| Indoor/Outdoor use                                                            | Indoor use                                                                                                                                                                                                                      |
| Assumes process temperature up to                                             | <= 40°C                                                                                                                                                                                                                         |
| Use in room with a volume of minimum                                          | > 100 m3                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3                                                                                                                                                                                                                             |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 30 m3                                                                                                                                                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 1                                                                                                                                                                                                                                                                                                                                                            |

|                                           |                                                                   |
|-------------------------------------------|-------------------------------------------------------------------|
| Process category(ies)                     | PROC15 - Use as laboratory reagent                                |
| Covers concentrations up to               | 5%                                                                |
| Physical form of product                  | Liquid                                                            |
| Vapour pressure                           | 2140 hPa                                                          |
| Temperature associated to vapour pressure | 40°C                                                              |
| Use frequency                             | Covers daily exposures up to 8 hours (unless stated differently). |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training<br>Efficiency of at least 95%                                                                                  |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

### Section 3 - Exposure estimation

**Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)**

**Predicted No Effect Concentration (PNEC)**

|                                   |             |
|-----------------------------------|-------------|
| <b>Freshwater</b>                 | 0.066 mg/l  |
| <b>Freshwater sediment</b>        | 0.246 mg/kg |
| <b>Marine water</b>               | 0.004 mg/l  |
| <b>Marine sediment</b>            | 0.015 mg/kg |
| <b>Soil</b>                       | 0.01 mg/kg  |
| <b>Impact on Sewage Treatment</b> | 10 mg/l     |
| <b>Intermittent release</b>       | 0.661 mg/l  |

**Calculation method**

Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.00488 mg/l             | 0.074                             |
| Freshwater sediment         | 0.018 mg/kg d.w.         | 0.074                             |
| Marine water                | 0.000485 mg/l            | 0.121                             |
| Marine sediment             | 0.0018 mg/kg d.w.        | 0.12                              |
| STP: Sewage Treatment Plant | 0.047 mg/l               | < 0.01                            |
| Soil                        | 0.000156 mg/kg d.w.      | 0.016                             |

**Derived No Effect Level (DNEL):**

|                                               |                        |
|-----------------------------------------------|------------------------|
| <b>Worker - dermal, long-term - systemic</b>  | 0.25 mg/kg             |
| <b>Worker - dermal, short-term - local</b>    | 100 µg/cm <sup>2</sup> |
| <b>Worker - dermal, short-term - systemic</b> | 1.2 mg/kg              |
| <b>Worker - inhalative, long-term - local</b> | 1.76 mg/m <sup>3</sup> |

|                                                    |                         |
|----------------------------------------------------|-------------------------|
| <b>Worker - inhalative, long-term - systemic</b>   | 1.76 mg/m <sup>3</sup>  |
| <b>Worker - inhalative, short-term - local</b>     | 13.53 mg/m <sup>3</sup> |
| <b>Worker - inhalative, short-term - systemic</b>  | 5.28 mg/m <sup>3</sup>  |
| <b>Consumer - oral, long-term - systemic</b>       | 0.148 mg/kg             |
| <b>Consumer - inhalative, long-term - systemic</b> | 0.438 mg/m <sup>3</sup> |

| <b>Calculation method</b>                                                     | <b>Used ECETOC TRA model<br/>Used ART model</b> |                                 |                                          |
|-------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------|------------------------------------------|
| <b>Process category(ies)</b>                                                  | <b>Exposure route</b>                           | <b>predicted exposure level</b> | <b>Risk characterisation ratio (RCR)</b> |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic       | 0.037 mg/m <sup>3</sup>         | 0.021                                    |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic      | 0.149 mg/m <sup>3</sup>         | 0.028                                    |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local          | 0.037 mg/m <sup>3</sup>         | 0.021                                    |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local         | 0.149 mg/m <sup>3</sup>         | 0.011                                    |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic           | 0.0017 mg/kg bw/d               | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local              | 0.000496 mg/m <sup>3</sup>      |                                          |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local             | 0.000496 mg/m <sup>3</sup>      | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic         |                                 | 0.028                                    |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic       | 0.00743 mg/m <sup>3</sup>       | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic      | 0.03 mg/m <sup>3</sup>          | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local         | 0.03 mg/m <sup>3</sup>          | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local          | 0.00743 mg/m <sup>3</sup>       | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic           | 0.00034 mg/kg bw/d              | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local             | 0.000092 mg/m <sup>3</sup>      | < 0.01                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local              | 0.000092 mg/m <sup>3</sup>      |                                          |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic         |                                 | < 0.01                                   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - systemic       | 0.371 mg/m <sup>3</sup>         | 0.211                                    |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - systemic      | 1.486 mg/m <sup>3</sup>         | 0.281                                    |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - local         | 1.486 mg/m <sup>3</sup>         | 0.011                                    |

|                                                                                          |                                            |                         |       |
|------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - inhalative, long-term - local     | 0.371 mg/m <sup>3</sup> | 0.211 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, long-term - systemic      | 0.014 mg/kg bw/d        | 0.055 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, short-term - local        | 0.002 mg/m <sup>3</sup> | 0.02  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - dermal, long-term - local         | 0.002 mg/m <sup>3</sup> |       |
| PROC2 - Use in closed, continuous process with occasional controlled exposure            | Worker - combined, long-term - systemic    |                         | 0.266 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, long-term - systemic  | 0.743 mg/m <sup>3</sup> | 0.422 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup> | 0.563 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup> | 0.22  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, long-term - local     | 0.743 mg/m <sup>3</sup> | 0.422 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - systemic      | 0.0069 mg/kg bw/d       | 0.028 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, short-term - local        | 0.002 mg/m <sup>3</sup> | 0.02  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - local         | 0.002 mg/m <sup>3</sup> |       |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - combined, long-term - systemic    |                         | 0.45  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - systemic  | 1.04 mg/m <sup>3</sup>  | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - systemic | 4.16 mg/m <sup>3</sup>  | 0.788 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - local    | 4.16 mg/m <sup>3</sup>  | 0.307 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - local     | 1.04 mg/m <sup>3</sup>  | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, long-term - systemic      | 0.03 mg/kg bw/d         | 0.12  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, short-term - local        | 0.004 mg/m <sup>3</sup> | 0.04  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, long-term - local         | 0.004 mg/m <sup>3</sup> |       |

|                                                                                                                                     |                                            |                         |       |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                            | Worker - combined, long-term - systemic    |                         | 0.711 |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - inhalative, long-term - systemic  | 0.223 mg/m <sup>3</sup> | 0.127 |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup> | 0.281 |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup> | 0.11  |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - inhalative, long-term - local     | 0.223 mg/m <sup>3</sup> | 0.127 |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - dermal, long-term - systemic      | 0.055 mg/kg bw/d        | 0.22  |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - dermal, short-term - local        | 0.004 mg/m <sup>3</sup> | 0.04  |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - dermal, long-term - local         | 0.004 mg/m <sup>3</sup> |       |
| PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) | Worker - combined, long-term - systemic    |                         | 0.347 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities   | Worker - inhalative, long-term - systemic  | 0.085 mg/m <sup>3</sup> | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities   | Worker - inhalative, short-term - systemic | 2.8 mg/m <sup>3</sup>   | 0.53  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities   | Worker - inhalative, short-term - local    | 2.8 mg/m <sup>3</sup>   | 0.207 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities   | Worker - inhalative, long-term - local     | 0.085 mg/m <sup>3</sup> | 0.048 |
| PROC8a - Transfer of substance or                                                                                                   | Worker - dermal, long-term -               | 0.16 mg/kg bw/d         | 0.64  |

|                                                                                                                                            |                                               |                         |       |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------|-------|
| preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities                                      | systemic                                      |                         |       |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - dermal, short-term -<br>local        | 0.012 mg/m <sup>3</sup> | 0.12  |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - dermal, long-term -<br>local         | 0.012 mg/m <sup>3</sup> |       |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - combined, long-term<br>- systemic    |                         | 0.688 |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - inhalative, long-term<br>- systemic  | 0.68 mg/m <sup>3</sup>  | 0.386 |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - inhalative, short-term<br>- systemic | 2.72 mg/m <sup>3</sup>  | 0.515 |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - inhalative, short-term<br>- local    | 2.72 mg/m <sup>3</sup>  | 0.201 |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - inhalative, long-term<br>- local     | 0.68 mg/m <sup>3</sup>  | 0.386 |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - dermal, long-term -<br>systemic      | 0.055 mg/kg bw/d        | 0.22  |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - dermal, short-term -<br>local        | 0.004 mg/m <sup>3</sup> | 0.04  |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - dermal, long-term -<br>local         | 0.004 mg/m <sup>3</sup> |       |
| PROC8a - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at non<br>dedicated facilities | Worker - combined, long-term<br>- systemic    |                         | 0.606 |
| PROC8b - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at<br>dedicated facilities     | Worker - inhalative, long-term<br>- systemic  | 0.21 mg/m <sup>3</sup>  | 0.119 |
| PROC8b - Transfer of substance or                                                                                                          | Worker - inhalative, short-term               | 1.64 mg/m <sup>3</sup>  | 0.311 |

|                                                                                                                               |                                            |                         |       |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                   | - systemic                                 |                         |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term - local    | 1.64 mg/m <sup>3</sup>  | 0.121 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term - local     | 0.21 mg/m <sup>3</sup>  | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - systemic      | 0.16 mg/kg bw/d         | 0.64  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/m <sup>3</sup> | 0.12  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/m <sup>3</sup> |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.759 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term - systemic  | 0.557 mg/m <sup>3</sup> | 0.317 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup> | 0.703 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup> | 0.275 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term - local     | 0.557 mg/m <sup>3</sup> | 0.317 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - systemic      | 0.082 mg/kg bw/d        | 0.329 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term - local        | 0.006 mg/m <sup>3</sup> | 0.06  |
| PROC8b - Transfer of substance or                                                                                             | Worker - dermal, long-term -               | 0.006 mg/m <sup>3</sup> |       |

|                                                                                                                                        |                                               |                         |       |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------|-------|
| preparation (charging/discharging)<br>from/to vessels/large containers at<br>dedicated facilities                                      | local                                         |                         |       |
| PROC8b - Transfer of substance or<br>preparation (charging/discharging)<br>from/to vessels/large containers at<br>dedicated facilities | Worker - combined, long-term<br>- systemic    |                         | 0.646 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, long-term<br>- systemic  | 0.35 mg/m <sup>3</sup>  | 0.199 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, short-term<br>- systemic | 2.76 mg/m <sup>3</sup>  | 0.523 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, short-term<br>- local    | 2.76 mg/m <sup>3</sup>  | 0.204 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, long-term<br>- local     | 0.35 mg/m <sup>3</sup>  | 0.199 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - dermal, long-term -<br>systemic      | 0.08 mg/kg bw/d         | 0.32  |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - dermal, short-term -<br>local        | 0.012 mg/m <sup>3</sup> | 0.12  |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - dermal, long-term -<br>local         | 0.012 mg/m <sup>3</sup> |       |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - combined, long-term<br>- systemic    |                         | 0.519 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, long-term<br>- systemic  | 0.15 mg/m <sup>3</sup>  | 0.085 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, short-term<br>- systemic | 0.6 mg/m <sup>3</sup>   | 0.114 |
| PROC9 - Transfer of substance or<br>preparation into small containers<br>(dedicated filling line, including<br>weighing)               | Worker - inhalative, short-term<br>- local    | 0.6 mg/m <sup>3</sup>   | 0.044 |
| PROC9 - Transfer of substance or                                                                                                       | Worker - inhalative, long-term                | 0.15 mg/m <sup>3</sup>  | 0.085 |

|                                                                                                                 |                                            |                            |        |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------|--------|
| preparation into small containers (dedicated filling line, including weighing)                                  | - local                                    |                            |        |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - systemic      | 0.069 mg/kg bw/d           | 0.274  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, short-term - local        | 0.01 mg/m <sup>3</sup>     | 0.1    |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - local         | 0.01 mg/m <sup>3</sup>     |        |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - combined, long-term - systemic    |                            | 0.36   |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - systemic  | 0.743 mg/m <sup>3</sup>    | 0.422  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup>    | 0.563  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup>    | 0.22   |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - local     | 0.743 mg/m <sup>3</sup>    | 0.422  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - systemic      | 0.0034 mg/kg bw/d          | 0.014  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, short-term - local        | 0.000922 mg/m <sup>3</sup> | < 0.01 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - local         | 0.000922 mg/m <sup>3</sup> |        |
| PROC15 - Use as laboratory reagent                                                                              | Worker - combined, long-term - systemic    |                            | 0.436  |

## Section 4 - Guidance to check compliance with the exposure scenario

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Industrial use resulting in manufacture of another substance (use of intermediates)  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)  
**Process category(ies)** 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)  
 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  
  
**Sector(s) of use** SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU9  
 - Manufacture of fine chemicals

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

#### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 1000                |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 3333               |
| Units | kg/d                  |

#### Product characteristics

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
|--------------------------|--------|

#### Other operational conditions of use affecting environmental exposure

|      |                      |
|------|----------------------|
| Type | Intermittent release |
|------|----------------------|

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

|      |            |
|------|------------|
| Type | Onsite STP |
|------|------------|

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Assumed on-site sewage treatment plant flow | 2000 m3/d                                   |
| Sludge treatment                            | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control of worker exposure</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                |
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Use suitable eye protection<br>Wear suitable face shield<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |

|                                                                               |            |
|-------------------------------------------------------------------------------|------------|
| Indoor/Outdoor use                                                            | Indoor use |
| Assumes process temperature up to                                             | <= 40°C    |
| Use in room with a volume of minimum                                          | > 1000 m3  |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC3 - Use in closed batch process (synthesis or formulation)                                                                                                                                                                                                                                                                                                 |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 1000 m3                                                                                                                                                                                                                                                                                                                                                      |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                             |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                      |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                    |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                    |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                         |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98% |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area                                                                                                |

|                                                                               |                                                                                                                                                                  |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                               | Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report       | Avoid contact with contaminated tools and objects                                                                                                                |
| Indoor/Outdoor use                                                            | Indoor use                                                                                                                                                       |
| Assumes process temperature up to                                             | <= 40°C                                                                                                                                                          |
| Use in room with a volume of minimum                                          | > 300 m <sup>3</sup>                                                                                                                                             |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3                                                                                                                                                              |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                           |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC15 - Use as laboratory reagent                                                                                                                                                                                                   |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                 |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                               |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                             |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                 |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                               |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                    |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) |
| Conditions and measures related to personal protection, hygiene and                    | Wear suitable face shield<br>Use suitable eye protection                                                                                                                                                                             |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| health evaluation                                                           | Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                                                                                 |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

### Section 3 - Exposure estimation

**Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)**

#### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

#### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.000197 mg/l            | < 0.01                            |
| Freshwater sediment         | 0.000735 mg/kg d.w.      | < 0.01                            |
| Marine water                | 0.0000168 mg/l           | < 0.01                            |
| Marine sediment             | 0.0000624 mg/kg d.w.     | < 0.01                            |
| STP: Sewage Treatment Plant | 0 mg/l                   | < 0.01                            |
| Soil                        | 0.0000113 mg/kg d.w.     | < 0.01                            |

#### Derived No Effect Level (DNEL):

|                                             |                         |
|---------------------------------------------|-------------------------|
| Worker - dermal, long-term - systemic       | 0.25 mg/kg              |
| Worker - dermal, short-term - local         | 100 µg/cm <sup>2</sup>  |
| Worker - dermal, short-term - systemic      | 1.2 mg/kg               |
| Worker - inhalative, long-term - local      | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, long-term - systemic   | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, short-term - local     | 13.53 mg/m <sup>3</sup> |
| Worker - inhalative, short-term - systemic  | 5.28 mg/m <sup>3</sup>  |
| Consumer - oral, long-term - systemic       | 0.148 mg/kg             |
| Consumer - inhalative, long-term - systemic | 0.438 mg/m <sup>3</sup> |

#### Calculation method Used ECETOC TRA model Used ART model

| Process category(ies) | Exposure route | predicted exposure level | Risk characterisation ratio |
|-----------------------|----------------|--------------------------|-----------------------------|
|-----------------------|----------------|--------------------------|-----------------------------|

|                                                                               |                                            |                            |        |
|-------------------------------------------------------------------------------|--------------------------------------------|----------------------------|--------|
|                                                                               |                                            |                            | (RCR)  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic  | 0.037 mg/m <sup>3</sup>    | 0.021  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic | 0.149 mg/m <sup>3</sup>    | 0.028  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.037 mg/m <sup>3</sup>    | 0.021  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.149 mg/m <sup>3</sup>    | 0.011  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.0017 mg/kg bw/d          | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.000496 mg/m <sup>3</sup> |        |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.000496 mg/m <sup>3</sup> | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                            | 0.028  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - systemic  | 0.94 mg/m <sup>3</sup>     | 0.534  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - systemic | 3.76 mg/m <sup>3</sup>     | 0.712  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - local    | 3.76 mg/m <sup>3</sup>     | 0.278  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - local     | 0.94 mg/m <sup>3</sup>     | 0.534  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - systemic      | 0.0027 mg/kg bw/d          | 0.11   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, short-term - local        | 0.004 mg/m <sup>3</sup>    | < 0.01 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - local         | 0.004 mg/m <sup>3</sup>    |        |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - combined, long-term - systemic    |                            | 0.644  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, long-term - systemic  | 0.94 mg/m <sup>3</sup>     | 0.534  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, short-term - systemic | 3.76 mg/m <sup>3</sup>     | 0.712  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, short-term - local    | 3.76 mg/m <sup>3</sup>     | 0.278  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, long-term - local     | 0.94 mg/m <sup>3</sup>     | 0.534  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - dermal, long-term - systemic      | 0.034 mg/kg bw/d           | 0.138  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - dermal, short-term - local        | 0.01 mg/cm <sup>2</sup>    | 0.101  |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - dermal, long-term - local         | 0.01 mg/cm <sup>2</sup>    |        |
| PROC3 - Use in closed batch process                                           | Worker - combined, long-term               |                            | 0.672  |

|                                                                                                                               |                                               |                          |       |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------|-------|
| (synthesis or formulation)                                                                                                    | - systemic                                    |                          |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term<br>- systemic  | 0.21 mg/m <sup>3</sup>   | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term<br>- systemic | 1.64 mg/m <sup>3</sup>   | 0.311 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term<br>- local    | 1.64 mg/m <sup>3</sup>   | 0.121 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term<br>- local     | 0.21 mg/m <sup>3</sup>   | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term -<br>systemic      | 0.16 mg/kg bw/d          | 0.64  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term -<br>local        | 0.12 mg/cm <sup>2</sup>  | 0.12  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term -<br>local         | 0.12 mg/cm <sup>2</sup>  |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term<br>- systemic    |                          | 0.759 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term<br>- systemic  | 0.35 mg/m <sup>3</sup>   | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term<br>- systemic | 2.76 mg/m <sup>3</sup>   | 0.523 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term<br>- local    | 2.76 mg/m <sup>3</sup>   | 0.204 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term<br>- local     | 0.35 mg/m <sup>3</sup>   | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term -<br>systemic      | 0.08 mg/kg bw/d          | 0.32  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, short-term -<br>local        | 0.012 mg/cm <sup>2</sup> | 0.12  |

|                                                                                                                 |                                            |                            |       |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------|-------|
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - local         | 0.012 mg/cm <sup>2</sup>   |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - combined, long-term - systemic    |                            | 0.519 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - systemic  | 0.233 mg/m <sup>3</sup>    | 0.127 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup>    | 0.281 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup>    | 0.11  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - local     | 0.233 mg/m <sup>3</sup>    | 0.127 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - systemic      | 0.01 mg/kg bw/d            | 0.041 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, short-term - local        | 0.00298 mg/cm <sup>2</sup> | 0.03  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - local         | 0.00298 mg/cm <sup>2</sup> |       |
| PROC15 - Use as laboratory reagent                                                                              | Worker - combined, long-term - systemic    |                            | 0.167 |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Polymer preparations and compounds  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC6b - Industrial use of reactive processing aids  
**Process category(ies)** 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  
 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)  
 PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising  
 PROC21 - Low energy manipulation of substances bound in materials and/or articles  
 PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles  
  
**Product category(ies)** PC32 - Polymer preparations and compounds  
**Sector(s) of use** SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites  
 SU11 - Manufacture of rubber products SU12 - Manufacture of plastics products, including compounding and conversion

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC6b - Industrial use of reactive processing aids

##### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 1000                |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 3333               |
| Units | kg/d                  |

**ES01955 - 2-dimethylaminoethanol (203-542-8) - Use by industrial workers as processing aid. Catalyst. Polymer preparations and compounds (PC32); Manufacture of rubber products (SU11).; Manufacture of plastics products, including compounding and conversion (SU12).**

**Revision date** 23-Jun-2026

**Product characteristics**

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
|--------------------------|--------|

**Other operational conditions of use affecting environmental exposure**

|      |                      |
|------|----------------------|
| Type | Intermittent release |
|------|----------------------|

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

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Type                                        | Onsite STP                                  |
| Assumed on-site sewage treatment plant flow | 2000 m3/d                                   |
| Sludge treatment                            | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

**Control of worker exposure**

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                          |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                              |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                            |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                          |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                              |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                                 |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source                                                                                                                                                                                        |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training<br>Efficiency of at least 95%<br>Wear suitable face shield<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Use suitable eye protection                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment<br>Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                                 |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                        |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                           |

|                                                                                        |                                                                                                                                                                            |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                   |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                         |
| Physical form of product                                                               | Liquid                                                                                                                                                                     |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                   |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                       |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                          |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) |
| Conditions and measures related to                                                     | Wear suitable face shield                                                                                                                                                  |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| personal protection, hygiene and health evaluation                          | Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                                                  |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Local exhaust ventilation - efficiency of at least 90%                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC3 - Use in closed batch process (synthesis or formulation)                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                   |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                               |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                             |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                 |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                    |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) |
| Conditions and measures related to                                                     | Wear suitable face shield                                                                                                                                                                                                            |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| personal protection, hygiene and health evaluation                          | Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                                                  |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 30%                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                     |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC7 - Industrial spraying                                                                                                                         |
| Covers concentrations up to                                                            | 5%                                                                                                                                                  |
| Physical form of product                                                               | Liquid                                                                                                                                              |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                            |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                              |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                   |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                                                                                                                                                                                  |
| Conditions and measures related to personal protection, hygiene and health evaluation | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure           | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report               | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                    | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                     | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out operation for more than 1 hour                                                                                                                                                                                                                                                                                                              |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                             |                                                                                                                                   |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                       | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities |
| Covers concentrations up to                                                 | 5%                                                                                                                                |
| Physical form of product                                                    | Liquid                                                                                                                            |
| Use frequency                                                               | Covers daily exposures up to 8 hours (unless stated differently).                                                                 |
| Technical conditions and measures to control dispersion from source towards | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source                               |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                |
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| the worker                                                                            | Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure           | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report               | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                    | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                     | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                  | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)         | > 3                                                                                                                                                                                                                                                                                                                                                            |

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| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 95%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                       |                                                                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies) | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|

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|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

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| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                   |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per                | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
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| hour)                                                                                  |                                                                                                                                                                                                                                                                                                                                                                |
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 30 m3                                                                                                                                                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 1                                                                                                                                                                                                                                                                                                                                                            |

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|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising                                                                                                                                                                          |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Solid, medium dustiness                                                                                                                                                                                                                                                    |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                   |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                       |
| Amounts used                                                                           | 2000 mg/kg                                                                                                                                                                                                                                                                 |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                          |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                       |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% |
| Organisational measures to prevent /limit releases, dispersion and                     | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented                                                                                                                                                |

|                                                                               |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| exposure                                                                      | Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report       | Avoid contact with contaminated tools and objects                                                                                                                                                                               |
| Indoor/Outdoor use                                                            | Indoor use                                                                                                                                                                                                                      |
| Assumes process temperature up to                                             | <= 40°C                                                                                                                                                                                                                         |
| Use in room with a volume of minimum                                          | > 100 m3                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 1                                                                                                                                                                                                                             |

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|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC21 - Low energy manipulation of substances bound in materials and/or articles                                                                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Solid, low dustiness                                                                                                                                                                                                                                                                                                                                           |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                            |
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| Process category(ies)                                                                  | PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles                                                                                                                                                                                 |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                         |
| Physical form of product                                                               | Solid, low dustiness                                                                                                                                                                                                                                                       |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                          |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Local exhaust ventilation - efficiency of at least 90%                                       |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95% |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area                                                                                 |

|                                                                         |                                                                                                                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report | Avoid contact with contaminated tools and objects                                                                                                                |
| Indoor/Outdoor use                                                      | Indoor use                                                                                                                                                       |
| Assumes process temperature up to                                       | <= 40°C                                                                                                                                                          |

### Section 3 - Exposure estimation

#### Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

##### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

##### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.000197 mg/l            | < 0.01                            |
| Freshwater sediment         | 0.000735 mg/kg d.w.      | < 0.01                            |
| Marine water                | 0.0000168 mg/l           | < 0.01                            |
| Marine sediment             | 0.0000624 mg/kg d.w.     | < 0.01                            |
| STP: Sewage Treatment Plant | 0 mg/l                   | < 0.01                            |
| Soil                        | 0.00011 mg/kg d.w.       | 0.011                             |

##### Derived No Effect Level (DNEL):

|                                             |             |
|---------------------------------------------|-------------|
| Worker - dermal, long-term - systemic       | 0.25 mg/kg  |
| Worker - dermal, short-term - local         | 100 µg/cm²  |
| Worker - dermal, short-term - systemic      | 1.2 mg/kg   |
| Worker - inhalative, long-term - local      | 1.76 mg/m³  |
| Worker - inhalative, long-term - systemic   | 1.76 mg/m³  |
| Worker - inhalative, short-term - local     | 13.53 mg/m³ |
| Worker - inhalative, short-term - systemic  | 5.28 mg/m³  |
| Consumer - oral, long-term - systemic       | 0.148 mg/kg |
| Consumer - inhalative, long-term - systemic | 0.438 mg/m³ |

##### Calculation method Used ECETOC TRA model Used ART model

| Process category(ies)                                    | Exposure route                            | predicted exposure level | Risk characterisation ratio (RCR) |
|----------------------------------------------------------|-------------------------------------------|--------------------------|-----------------------------------|
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - systemic | 0.037 mg/m³              | 0.021                             |
| PROC1 - Use in closed process, no                        | Worker - inhalative, short-term           | 0.149 mg/m³              | 0.028                             |

|                                                                               |                                            |                              |        |
|-------------------------------------------------------------------------------|--------------------------------------------|------------------------------|--------|
| likelihood of exposure                                                        | - systemic                                 |                              |        |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.037 mg/m <sup>3</sup>      | 0.021  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.149 mg/m <sup>3</sup>      | 0.011  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.0017 mg/kg bw/d            | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.000496 mg/cm <sup>2</sup>  |        |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.000496 mg/cm <sup>2</sup>  | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                              | 0.028  |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic  | 0.00743 mg/m <sup>3</sup>    | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic | 0.03 mg/m <sup>3</sup>       | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.03 mg/m <sup>3</sup>       | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.00743 mg/m <sup>3</sup>    | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.00034 mg/kg bw/d           | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.0000992 mg/cm <sup>2</sup> | < 0.01 |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.0000992 mg/cm <sup>2</sup> |        |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                              | < 0.01 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - systemic  | 0.371 mg/m <sup>3</sup>      | 0.211  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup>      | 0.281  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup>      | 0.011  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - local     | 0.371 mg/m <sup>3</sup>      | 0.211  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - systemic      | 0.014 mg/kg bw/d             | 0.055  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, short-term - local        | 0.002 mg/cm <sup>2</sup>     | 0.02   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - local         | 0.002 mg/m <sup>3</sup>      |        |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - combined, long-term - systemic    |                              | 0.266  |
| PROC3 - Use in closed batch process                                           | Worker - inhalative, long-term             | 0.743 mg/m <sup>3</sup>      | 0.422  |

|                                                                                          |                                            |                          |       |
|------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| (synthesis or formulation)                                                               | - systemic                                 |                          |       |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup>  | 0.563 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup>  | 0.22  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - inhalative, long-term - local     | 0.743 mg/m <sup>3</sup>  | 0.422 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - systemic      | 0.0069 mg/kg bw/d        | 0.028 |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, short-term - local        | 0.002 mg/cm <sup>2</sup> | 0.02  |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - dermal, long-term - local         | 0.002 mg/cm <sup>2</sup> |       |
| PROC3 - Use in closed batch process (synthesis or formulation)                           | Worker - combined, long-term - systemic    |                          | 0.45  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - systemic  | 1.04 mg/m <sup>3</sup>   | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - systemic | 4.16 mg/m <sup>3</sup>   | 0.788 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, short-term - local    | 4.16 mg/m <sup>3</sup>   | 0.307 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - inhalative, long-term - local     | 1.04 mg/m <sup>3</sup>   | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, long-term - systemic      | 0.03 mg/kg bw/d          | 0.12  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup> | 0.04  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - dermal, long-term - local         | 0.004 mg/cm <sup>2</sup> |       |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises | Worker - combined, long-term - systemic    |                          | 0.711 |
| PROC7 - Industrial spraying                                                              | Worker - inhalative, long-term - systemic  | 0.557 mg/m <sup>3</sup>  | 0.317 |
| PROC7 - Industrial spraying                                                              | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup>  | 0.703 |
| PROC7 - Industrial spraying                                                              | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup>  | 0.275 |
| PROC7 - Industrial spraying                                                              | Worker - inhalative, long-term - local     | 0.557 mg/m <sup>3</sup>  | 0.317 |
| PROC7 - Industrial spraying                                                              | Worker - dermal, long-term - systemic      | 0.103 mg/kg bw/d         | 0.412 |
| PROC7 - Industrial spraying                                                              | Worker - dermal, short-term - local        | 0.005 mg/cm <sup>2</sup> | 0.05  |
| PROC7 - Industrial spraying                                                              | Worker - dermal, long-term - local         | 0.005 mg/cm <sup>2</sup> |       |
| PROC7 - Industrial spraying                                                              | Worker - combined, long-term               |                          | 0.729 |

|                                                                                                                                   |                                               |                          |       |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------|-------|
|                                                                                                                                   | - systemic                                    |                          |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term<br>- systemic  | 0.085 mg/m <sup>3</sup>  | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term<br>- systemic | 2.8 mg/m <sup>3</sup>    | 0.53  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term<br>- local    | 2.8 mg/m <sup>3</sup>    | 0.207 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term<br>- local     | 0.085 mg/m <sup>3</sup>  | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic         | 0.16 mg/kg bw/d          | 0.64  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local           | 0.012 mg/cm <sup>2</sup> | 0.12  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local            | 0.012 mg/cm <sup>2</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic       |                          | 0.688 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term<br>- systemic  | 0.68 mg/m <sup>3</sup>   | 0.386 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term<br>- systemic | 2.72 mg/m <sup>3</sup>   | 0.515 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term<br>- local    | 2.72 mg/m <sup>3</sup>   | 0.201 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term<br>- local     | 0.68 mg/m <sup>3</sup>   | 0.386 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic         | 0.055 mg/kg bw/d         | 0.22  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local           | 0.004 mg/cm <sup>2</sup> | 0.04  |

|                                                                                                                                   |                                            |                         |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| from/to vessels/large containers at non dedicated facilities                                                                      |                                            |                         |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.004 mg/cm2            |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.606 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.21 mg/m <sup>3</sup>  | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 1.64 mg/m <sup>3</sup>  | 0.311 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 1.64 mg/m <sup>3</sup>  | 0.121 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - local     | 0.21 mg/m <sup>3</sup>  | 0.119 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - systemic      | 0.16 mg/kg bw/d         | 0.64  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, short-term - local        | 0.012 mg/cm2            | 0.12  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - local         | 0.012 mg/cm2            |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - combined, long-term - systemic    |                         | 0.759 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.929 mg/m <sup>3</sup> | 0.528 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup> | 0.703 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup> | 0.275 |
| PROC8b - Transfer of substance or                                                                                                 | Worker - inhalative, long-term             | 0.929 mg/m <sup>3</sup> | 0.528 |

|                                                                                                                               |                                            |                        |       |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------|-------|
| preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                   | - local                                    |                        |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - systemic      | 0.055 mg/kg bw/d       | 0.22  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term - local        | 0.004 mg/cm2           | 0.04  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - local         | 0.004 mg/cm2           |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                        | 0.748 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - systemic  | 0.35 mg/m <sup>3</sup> | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - systemic | 2.76 mg/m <sup>3</sup> | 0.523 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - local    | 2.76 mg/m <sup>3</sup> | 0.204 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - local     | 0.35 mg/m <sup>3</sup> | 0.199 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - systemic      | 0.08 mg/kg bw/d        | 0.32  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, short-term - local        | 0.012 mg/cm2           | 0.12  |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - local         | 0.012 mg/cm2           |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - combined, long-term - systemic    |                        | 0.519 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - systemic  | 0.15 mg/m <sup>3</sup> | 0.085 |

|                                                                                                                 |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - systemic | 0.6 mg/m <sup>3</sup>    | 0.114 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - local    | 0.6 mg/m <sup>3</sup>    | 0.044 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, long-term - local     | 0.15 mg/m <sup>3</sup>   | 0.085 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - systemic      | 0.069 mg/kg bw/d         | 0.274 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, short-term - local        | 0.01 mg/cm <sup>2</sup>  | 0.1   |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - local         | 0.01 mg/cm <sup>2</sup>  |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - combined, long-term - systemic    |                          | 0.36  |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - inhalative, long-term - systemic  | 0.6 mg/m <sup>3</sup>    | 0.341 |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - inhalative, short-term - systemic | 2.4 mg/m <sup>3</sup>    | 0.455 |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - inhalative, short-term - local    | 2.4 mg/m <sup>3</sup>    | 0.177 |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - inhalative, long-term - local     | 0.6 mg/m <sup>3</sup>    | 0.341 |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - dermal, long-term - systemic      | 0.034 mg/kg bw/d         | 0.137 |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - dermal, short-term - local        | 0.005 mg/cm <sup>2</sup> | 0.05  |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - dermal, long-term - local         | 0.005 mg/cm <sup>2</sup> |       |
| PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising               | Worker - combined, long-term - systemic    |                          | 0.478 |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles                               | Worker - inhalative, long-term - systemic  | 0.2 mg/m <sup>3</sup>    | 0.114 |

|                                                                                            |                                            |                          |       |
|--------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - inhalative, short-term - systemic | 0.8 mg/m <sup>3</sup>    | 0.152 |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - inhalative, short-term - local    | 0.8 mg/m <sup>3</sup>    | 0.059 |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - inhalative, long-term - local     | 0.2 mg/m <sup>3</sup>    | 0.114 |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - dermal, long-term - systemic      | 0.028 mg/kg bw/d         | 0.112 |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - dermal, short-term - local        | 0.001 mg/cm <sup>2</sup> | 0.01  |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - dermal, long-term - local         | 0.001 mg/cm <sup>2</sup> |       |
| PROC21 - Low energy manipulation of substances bound in materials and/or articles          | Worker - combined, long-term - systemic    |                          | 0.266 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - inhalative, long-term - systemic  | 0.2 mg/m <sup>3</sup>    | 0.114 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - inhalative, short-term - systemic | 0.8 mg/m <sup>3</sup>    | 0.152 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - inhalative, short-term - local    | 0.8 mg/m <sup>3</sup>    | 0.059 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - inhalative, long-term - local     | 0.2 mg/m <sup>3</sup>    | 0.114 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - dermal, long-term - systemic      | 0.028 mg/kg bw/d         | 0.112 |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - dermal, short-term - local        | 0.001 mg/cm <sup>2</sup> | 0.01  |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - dermal, long-term - local         | 0.001 mg/cm <sup>2</sup> |       |
| PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles | Worker - combined, long-term - systemic    |                          | 0.266 |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Coatings and Inks  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles  
**Process category(ies)** 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  
 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  
 PROC15 - Use as laboratory reagent  
**Product category(ies)** PC9a - Coatings and paints, thinners, paint removers PC18 - Ink and toners PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids  
**Sector(s) of use** SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

##### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 1000                |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 3333               |
| Units | kg/d                  |

**Product characteristics**

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
| Vapour pressure          | 10 hPa |

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

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Type                                        | Onsite STP                                  |
| Assumed on-site sewage treatment plant flow | 2000 m3/d                                   |
| Sludge treatment                            | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

**Control of worker exposure**

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                        |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                   |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                               |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                             |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                 |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                    |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Local exhaust ventilation - efficiency of at least 90% |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better                                                                                            |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                                                                                                                                                                  |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC3 - Use in closed batch process (synthesis or formulation)                                                                                                                                                                                                                                                                                                 |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                                                                                                                                                                        |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                              |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                          |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                        |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                            |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                               |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 30% |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better                                                                                                                                       |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                                                                                                                                                                   |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC7 - Industrial spraying                                                                                                                                                                                                                                                                                                                                    |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                 |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                              |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                            |
| Exposure duration                                                                      | Avoid carrying out operation for more than 1 hour                                                                                                                                                                                                 |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                 |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive                    |

|                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                               | management supervision controls Efficiency of at least 98%                                                                                                                                                                                                                                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure   | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report       | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                            | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                             | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                          | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour) | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
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| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                                                                                                                                                                                  |
| Conditions and measures related to personal protection, hygiene and health evaluation | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure           | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report               | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                    | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                     | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                  | > 30 m3                                                                                                                                                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour)         | > 1                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC10 - Roller application or brushing                                                                                                                                                                                                                                                                                                                        |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                      |                                                                   |
|--------------------------------------|-------------------------------------------------------------------|
| Process category(ies)                | PROC15 - Use as laboratory reagent                                |
| Covers concentrations up to          | 5%                                                                |
| Physical form of product             | Liquid                                                            |
| Vapour pressure                      | 2140 hPa                                                          |
| Use frequency                        | Covers daily exposures up to 8 hours (unless stated differently). |
| Technical conditions and measures to | Ensure containment of the emission source                         |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| control dispersion from source towards the worker                                     | Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Local exhaust ventilation - efficiency of at least 90%                                                                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training<br>Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure           | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment<br>Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report               | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                                 |
| Indoor/Outdoor use                                                                    | Indoor use                                                                                                                                                                                                                                                                                                                                                        |
| Assumes process temperature up to                                                     | <= 40°C                                                                                                                                                                                                                                                                                                                                                           |

### Section 3 - Exposure estimation

**Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles**

#### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

#### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.000197 mg/l            | < 0.01                            |
| Freshwater sediment         | 0.000735 mg/kg d.w.      | < 0.01                            |
| Marine water                | 0.0000168 mg/l           | < 0.01                            |
| Marine sediment             | 0.0000624 mg/kg d.w.     | < 0.01                            |
| STP: Sewage Treatment Plant | 0 mg/l                   | < 0.01                            |
| Soil                        | 0.00011 mg/kg d.w.       | 0.011                             |

#### Derived No Effect Level (DNEL):

|                                            |                         |
|--------------------------------------------|-------------------------|
| Worker - dermal, long-term - systemic      | 0.25 mg/kg              |
| Worker - dermal, short-term - local        | 100 µg/cm <sup>2</sup>  |
| Worker - dermal, short-term - systemic     | 1.2 mg/kg               |
| Worker - inhalative, long-term - local     | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, long-term - systemic  | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, short-term - local    | 13.53 mg/m <sup>3</sup> |
| Worker - inhalative, short-term - systemic | 5.28 mg/m <sup>3</sup>  |
| Consumer - oral, long-term - systemic      | 0.148 mg/kg             |

**Consumer - inhalative, long-term - systemic**

0.438 mg/m<sup>3</sup>

**Calculation method**

Used ECETOC TRA model  
Used ART model

| Process category(ies)                                                         | Exposure route                             | predicted exposure level     | Risk characterisation ratio (RCR) |
|-------------------------------------------------------------------------------|--------------------------------------------|------------------------------|-----------------------------------|
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic  | 0.00743 mg/m <sup>3</sup>    | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic | 0.03 mg/m <sup>3</sup>       | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.03 mg/m <sup>3</sup>       | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.00743 mg/m <sup>3</sup>    | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.00034 mg/kg bw/d           | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.0000992 mg/cm <sup>2</sup> | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.0000992 mg/cm <sup>2</sup> |                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                              | < 0.01                            |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - systemic  | 0.371 mg/m <sup>3</sup>      | 0.211                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup>      | 0.281                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup>      | 0.11                              |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - local     | 0.371 mg/m <sup>3</sup>      | 0.211                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - systemic      | 0.014 mg/kg bw/d             | 0.055                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, short-term - local        | 0.002 mg/cm <sup>2</sup>     | 0.02                              |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - local         | 0.002 mg/m <sup>3</sup>      |                                   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - combined, long-term - systemic    |                              | 0.266                             |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, long-term - systemic  | 0.743 mg/m <sup>3</sup>      | 0.422                             |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup>      | 0.563                             |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup>      | 0.22                              |
| PROC3 - Use in closed batch process (synthesis or formulation)                | Worker - inhalative, long-term - local     | 0.743 mg/m <sup>3</sup>      | 0.422                             |

|                                                                                                                                   |                                            |                         |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| PROC3 - Use in closed batch process (synthesis or formulation)                                                                    | Worker - dermal, long-term - systemic      | 0.0069 mg/kg bw/d       | 0.028 |
| PROC3 - Use in closed batch process (synthesis or formulation)                                                                    | Worker - dermal, short-term - local        | 0.002 mg/cm2            | 0.02  |
| PROC3 - Use in closed batch process (synthesis or formulation)                                                                    | Worker - dermal, long-term - local         | 0.002 mg/cm2            |       |
| PROC3 - Use in closed batch process (synthesis or formulation)                                                                    | Worker - combined, long-term - systemic    |                         | 0.45  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - inhalative, long-term - systemic  | 1.04 mg/m <sup>3</sup>  | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - inhalative, short-term - systemic | 4.16 mg/m <sup>3</sup>  | 0.788 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - inhalative, short-term - local    | 4.16 mg/m <sup>3</sup>  | 0.307 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - inhalative, long-term - local     | 1.04 mg/m <sup>3</sup>  | 0.591 |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - dermal, long-term - systemic      | 0.03 mg/kg bw/d         | 0.12  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - dermal, short-term - local        | 0.004 mg/cm2            | 0.04  |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - dermal, long-term - local         | 0.004 mg/cm2            |       |
| PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises                                          | Worker - combined, long-term - systemic    |                         | 0.711 |
| PROC7 - Industrial spraying                                                                                                       | Worker - inhalative, long-term - systemic  | 0.557 mg/m <sup>3</sup> | 0.317 |
| PROC7 - Industrial spraying                                                                                                       | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup> | 0.703 |
| PROC7 - Industrial spraying                                                                                                       | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup> | 0.275 |
| PROC7 - Industrial spraying                                                                                                       | Worker - inhalative, long-term - local     | 0.557 mg/m <sup>3</sup> | 0.317 |
| PROC7 - Industrial spraying                                                                                                       | Worker - dermal, long-term - systemic      | 0.103 mg/kg bw/d        | 0.412 |
| PROC7 - Industrial spraying                                                                                                       | Worker - dermal, short-term - local        | 0.005 mg/cm2            | 0.05  |
| PROC7 - Industrial spraying                                                                                                       | Worker - dermal, long-term - local         | 0.005 mg/cm2            |       |
| PROC7 - Industrial spraying                                                                                                       | Worker - combined, long-term - systemic    |                         | 0.729 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - systemic  | 0.085 mg/m <sup>3</sup> | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non                      | Worker - inhalative, short-term - systemic | 2.8 mg/m <sup>3</sup>   | 0.53  |

|                                                                                                                                   |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| dedicated facilities                                                                                                              |                                            |                          |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - local    | 2.8 mg/m <sup>3</sup>    | 0.207 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - local     | 0.085 mg/m <sup>3</sup>  | 0.048 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic      | 0.16 mg/kg bw/d          | 0.64  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/cm <sup>2</sup> | 0.12  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/cm <sup>2</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic    |                          | 0.688 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.929 mg/m <sup>3</sup>  | 0.528 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup>  | 0.703 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup>  | 0.275 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - local     | 0.929 mg/m <sup>3</sup>  | 0.528 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - systemic      | 0.055 mg/kg bw/d         | 0.22  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup> | 0.04  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - local         | 0.004 mg/cm <sup>2</sup> |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - combined, long-term - systemic    |                          | 0.748 |

|                                                                                                                 |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| dedicated facilities                                                                                            |                                            |                          |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, long-term - systemic  | 0.15 mg/m <sup>3</sup>   | 0.085 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - systemic | 0.6 mg/m <sup>3</sup>    | 0.114 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - local    | 0.6 mg/m <sup>3</sup>    | 0.044 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, long-term - local     | 0.15 mg/m <sup>3</sup>   | 0.085 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - systemic      | 0.069 mg/kg bw/d         | 0.274 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, short-term - local        | 0.01 mg/cm <sup>2</sup>  | 0.1   |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - local         | 0.01 mg/cm <sup>2</sup>  |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - combined, long-term - systemic    |                          | 0.36  |
| PROC10 - Roller application or brushing                                                                         | Worker - inhalative, long-term - systemic  | 0.223 mg/m <sup>3</sup>  | 0.127 |
| PROC10 - Roller application or brushing                                                                         | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup>  | 0.281 |
| PROC10 - Roller application or brushing                                                                         | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup>  | 0.11  |
| PROC10 - Roller application or brushing                                                                         | Worker - inhalative, long-term - local     | 0.223 mg/m <sup>3</sup>  | 0.127 |
| PROC10 - Roller application or brushing                                                                         | Worker - dermal, long-term - systemic      | 0.11 mg/kg bw/d          | 0.44  |
| PROC10 - Roller application or brushing                                                                         | Worker - dermal, short-term - local        | 0.008 mg/cm <sup>2</sup> | 0.08  |
| PROC10 - Roller application or brushing                                                                         | Worker - dermal, long-term - local         | 0.008 mg/cm <sup>2</sup> |       |
| PROC10 - Roller application or brushing                                                                         | Worker - combined, long-term - systemic    |                          | 0.567 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - systemic  | 0.743 mg/m <sup>3</sup>  | 0.422 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup>  | 0.563 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup>  | 0.22  |

|                                    |                                         |                             |        |
|------------------------------------|-----------------------------------------|-----------------------------|--------|
| PROC15 - Use as laboratory reagent | Worker - inhalative, long-term - local  | 0.743 mg/m <sup>3</sup>     | 0.422  |
| PROC15 - Use as laboratory reagent | Worker - dermal, long-term - systemic   | 0.0034 mg/kg bw/d           | 0.014  |
| PROC15 - Use as laboratory reagent | Worker - dermal, short-term - local     | 0.000992 mg/cm <sup>2</sup> | < 0.01 |
| PROC15 - Use as laboratory reagent | Worker - dermal, long-term - local      | 0.000992 mg/cm <sup>2</sup> |        |
| PROC15 - Use as laboratory reagent | Worker - combined, long-term - systemic |                             | 0.436  |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Lubricants, greases, release products  
**Type** Worker  
**Main user group** Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental release category(ies)** ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles  
 ERC7 - Industrial use of substances in closed systems  
**Process category(ies)** PROC1 - Use in closed process, no likelihood of exposure  
 PROC2 - Use in closed, continuous process with occasional controlled exposure  
 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)  
**Product category(ies)** PC16 - Heat transfer fluids PC17 - Hydraulic fluids PC24 - Lubricants, greases, release products  
**Sector(s) of use** SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles  
 - ERC7 - Industrial use of substances in closed systems

#### Amounts used

|       |                        |
|-------|------------------------|
| Type  | Annual amount per site |
| Value | <= 10000               |
| Units | t(ons)/year            |

|       |                       |
|-------|-----------------------|
| Type  | Daily amount per site |
| Value | <= 33330              |
| Units | kg/d                  |

#### Other operational conditions of use affecting environmental exposure

|      |                      |
|------|----------------------|
| Type | Intermittent release |
|------|----------------------|

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

|      |            |
|------|------------|
| Type | Onsite STP |
|------|------------|

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Assumed on-site sewage treatment plant flow | 2000 m3/d                                   |
| Sludge treatment                            | Controlled application to agricultural soil |

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

| <b>Control of worker exposure</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%<br>Wear suitable face shield<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Use suitable eye protection                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                    |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                              |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                  |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                     |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>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                                                                                 |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                            |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs |

|                                                                         |                                                   |
|-------------------------------------------------------------------------|---------------------------------------------------|
|                                                                         | followed                                          |
| Additional good practice advice beyond the REACH Chemical Safety Report | Avoid contact with contaminated tools and objects |
| Indoor/Outdoor use                                                      | Outdoor use                                       |
| Assumes process temperature up to                                       | <= 40°C                                           |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Local exhaust ventilation - efficiency of at least 90%                                                                                                                           |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>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                                                               |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |

|                                   |             |
|-----------------------------------|-------------|
| the REACH Chemical Safety Report  |             |
| Indoor/Outdoor use                | Outdoor use |
| Assumes process temperature up to | <= 40°C     |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                                                                                                              |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)                                                                                                              |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98%                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                             |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                        |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                    |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                  |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                      |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                         |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 95%<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                      |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with intensive management supervision controls Efficiency of at least 98% |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area                                                                                                |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                        | Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed                                                                                                                                                                                               |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Process category(ies)                                                                  | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)                                                                                                                                                                                                                                                |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour)                                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Efficiency of at least 95%                                                                                     |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 30 m3                                                                                                                                                                                                                                                                                                                                                        |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 1                                                                                                                                                                                                                                                                                                                                                            |

### Section 3 - Exposure estimation

**Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles**

**- ERC7 - Industrial use of substances in closed systems**

**Predicted No Effect Concentration (PNEC)**

|                            |             |
|----------------------------|-------------|
| <b>Freshwater</b>          | 0.066 mg/l  |
| <b>Freshwater sediment</b> | 0.246 mg/kg |
| <b>Marine water</b>        | 0.004 mg/l  |
| <b>Marine sediment</b>     | 0.015 mg/kg |
| <b>Soil</b>                | 0.01 mg/kg  |

**Impact on Sewage Treatment** 10 mg/l  
**Intermittent release** 0.661 mg/l

**Calculation method** Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.000197 mg/l            | < 0.01                            |
| Freshwater sediment         | 0.000735 mg/kg d.w.      | < 0.01                            |
| Marine water                | 0.0000168 mg/l           | < 0.01                            |
| Marine sediment             | 0.0000624 mg/kg d.w.     | < 0.01                            |
| STP: Sewage Treatment Plant | 0 mg/l                   | < 0.01                            |
| Soil                        | 0.0000552 mg/kg d.w.     | < 0.01                            |

**Derived No Effect Level (DNEL):**

|                                                    |                         |
|----------------------------------------------------|-------------------------|
| <b>Worker - dermal, long-term - systemic</b>       | 0.25 mg/kg              |
| <b>Worker - dermal, short-term - local</b>         | 100 µg/cm <sup>2</sup>  |
| <b>Worker - dermal, short-term - systemic</b>      | 1.2 mg/kg               |
| <b>Worker - inhalative, long-term - local</b>      | 1.76 mg/m <sup>3</sup>  |
| <b>Worker - inhalative, long-term - systemic</b>   | 1.76 mg/m <sup>3</sup>  |
| <b>Worker - inhalative, short-term - local</b>     | 13.53 mg/m <sup>3</sup> |
| <b>Worker - inhalative, short-term - systemic</b>  | 5.28 mg/m <sup>3</sup>  |
| <b>Consumer - oral, long-term - systemic</b>       | 0.148 mg/kg             |
| <b>Consumer - inhalative, long-term - systemic</b> | 0.438 mg/m <sup>3</sup> |

**Calculation method** Used ECETOC TRA model  
Used ART model

| Process category(ies)                                    | Exposure route                             | predicted exposure level     | Risk characterisation ratio (RCR) |
|----------------------------------------------------------|--------------------------------------------|------------------------------|-----------------------------------|
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - systemic  | 0.00743 mg/m <sup>3</sup>    | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - systemic | 0.03 mg/m <sup>3</sup>       | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - local     | 0.00743 mg/m <sup>3</sup>    | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - local    | 0.03 mg/m <sup>3</sup>       | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, long-term - systemic      | 0.00034 mg/kg bw/d           | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, long-term - local         | 0.0000992 mg/cm <sup>2</sup> |                                   |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, short-term - local        | 0.0000992 mg/cm <sup>2</sup> | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - combined, long-term - systemic    |                              | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - systemic  | 0.0052 mg/m <sup>3</sup>     | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - systemic | 0.021 mg/m <sup>3</sup>      | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, short-term - local    | 0.021 mg/m <sup>3</sup>      | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - inhalative, long-term - local     | 0.0052 mg/m <sup>3</sup>     | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, long-term - systemic      | 0.00034 mg/kg bw/d           | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure | Worker - dermal, short-term -              | 0.0000992 mg/cm <sup>2</sup> | < 0.01                            |

|                                                                                                              |                                            |                         |        |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|--------|
| likelihood of exposure                                                                                       | local                                      |                         |        |
| PROC1 - Use in closed process, no likelihood of exposure                                                     | Worker - dermal, long-term - local         | 0.0000992 mg/cm2        |        |
| PROC1 - Use in closed process, no likelihood of exposure                                                     | Worker - combined, long-term - systemic    |                         | < 0.01 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, long-term - systemic  | 0.371 mg/m <sup>3</sup> | 0.211  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, short-term - systemic | 1.486 mg/m <sup>3</sup> | 0.281  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, short-term - local    | 1.486 mg/m <sup>3</sup> | 0.011  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, long-term - local     | 0.371 mg/m <sup>3</sup> | 0.211  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, long-term - systemic      | 0.014 mg/kg bw/d        | 0.055  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, short-term - local        | 0.002 mg/cm2            | 0.02   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, long-term - local         | 0.002 mg/m <sup>3</sup> |        |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - combined, long-term - systemic    |                         | 0.266  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, long-term - systemic  | 0.27 mg/m <sup>3</sup>  | 0.153  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, short-term - systemic | 1.08 mg/m <sup>3</sup>  | 0.205  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, short-term - local    | 1.08 mg/m <sup>3</sup>  | 0.08   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - inhalative, long-term - local     | 0.27 mg/m <sup>3</sup>  | 0.153  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, long-term - systemic      | 0.027 mg/kg bw/d        | 0.11   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, short-term - local        | 0.004 mg/cm2            | 0.04   |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - dermal, long-term - local         | 0.004 mg/cm2            |        |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                | Worker - combined, long-term - systemic    |                         | 0.263  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non | Worker - inhalative, long-term - systemic  | 0.68 mg/m <sup>3</sup>  | 0.386  |

|                                                                                                                                   |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| dedicated facilities                                                                                                              |                                            |                          |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - systemic | 2.72 mg/m <sup>3</sup>   | 0.515 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - local    | 2.72 mg/m <sup>3</sup>   | 0.201 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - local     | 0.68 mg/m <sup>3</sup>   | 0.386 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic      | 0.055 mg/kg bw/d         | 0.22  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup> | 0.04  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.004 mg/cm <sup>2</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic    |                          | 0.606 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.929 mg/m <sup>3</sup>  | 0.528 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 3.714 mg/m <sup>3</sup>  | 0.703 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 3.714 mg/m <sup>3</sup>  | 0.275 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - local     | 0.929 mg/m <sup>3</sup>  | 0.528 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - systemic      | 0.055 mg/kg bw/d         | 0.22  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup> | 0.04  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - local         | 0.004 mg/cm <sup>2</sup> |       |

|                                                                                                                               |                                            |                         |       |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.748 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - systemic  | 0.15 mg/m <sup>3</sup>  | 0.085 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - systemic | 0.6 mg/m <sup>3</sup>   | 0.114 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, short-term - local    | 0.6 mg/m <sup>3</sup>   | 0.044 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - inhalative, long-term - local     | 0.15 mg/m <sup>3</sup>  | 0.085 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - systemic      | 0.069 mg/kg bw/d        | 0.274 |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, short-term - local        | 0.01 mg/cm <sup>2</sup> | 0.1   |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - dermal, long-term - local         | 0.01 mg/cm <sup>2</sup> |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)               | Worker - combined, long-term - systemic    |                         | 0.36  |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Laboratory chemicals  
**Type** Worker  
**Main user group** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
**Environmental release category(ies)** ERC8a - Wide dispersive indoor use of processing aids in open systems  
**Process category(ies)** PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
 PROC15 - Use as laboratory reagent  
**Product category(ies)** PC21 - Laboratory chemicals  
**Sector(s) of use** SU22 - Professional uses SU24 - Scientific research and development

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC8a - Wide dispersive indoor use of processing aids in open systems

#### Amounts used

|       |                                       |
|-------|---------------------------------------|
| Type  | Daily amount for wide dispersive uses |
| Value | <= 0.554                              |
| Units | kg/d                                  |

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

|      |            |
|------|------------|
| Type | Onsite STP |
|------|------------|

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

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

#### Control of worker exposure

|                                           |                                                                                                                 |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Process category(ies)                     | PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| Covers concentrations up to               | 100%                                                                                                            |
| Physical form of product                  | Liquid                                                                                                          |
| Vapour pressure                           | 2140 hPa                                                                                                        |
| Temperature associated to vapour pressure | 40°C                                                                                                            |
| Exposure duration                         | Avoid carrying out activities involving exposure for more than 1 hour                                           |
| Use frequency                             | Covers daily exposures up to 8 hours (unless stated differently).                                               |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical conditions and measures to control dispersion from source towards the worker | Local exhaust ventilation - efficiency of at least 90%<br>Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 90%                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                           |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 1                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC15 - Use as laboratory reagent                                                                                                                                                                                                                                                                                                                             |
| Covers concentrations up to                                                            | 100%                                                                                                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 90%<br>Local exhaust ventilation - efficiency of at least 80%                                                                                                |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

### Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems

#### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

#### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.0024 mg/l              | 0.036                             |
| Freshwater sediment         | 0.00894 mg/kg d.w.       | 0.036                             |
| Marine water                | 0.000237 mg/l            | 0.059                             |
| Marine sediment             | 0.000883 mg/kg d.w.      | 0.059                             |
| STP: Sewage Treatment Plant | 0.022 mg/l               | < 0.01                            |
| Soil                        | 0.0000737 mg/kg d.w.     | < 0.01                            |

#### Derived No Effect Level (DNEL):

|                                             |                         |
|---------------------------------------------|-------------------------|
| Worker - dermal, long-term - systemic       | 0.25 mg/kg              |
| Worker - dermal, short-term - local         | 100 µg/cm <sup>2</sup>  |
| Worker - dermal, short-term - systemic      | 1.2 mg/kg               |
| Worker - inhalative, long-term - local      | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, long-term - systemic   | 1.76 mg/m <sup>3</sup>  |
| Worker - inhalative, short-term - local     | 13.53 mg/m <sup>3</sup> |
| Worker - inhalative, short-term - systemic  | 5.28 mg/m <sup>3</sup>  |
| Consumer - oral, long-term - systemic       | 0.148 mg/kg             |
| Consumer - inhalative, long-term - systemic | 0.438 mg/m <sup>3</sup> |

#### Calculation method Used ECETOC TRA model Used ART model

| Process category(ies)                                                                                           | Exposure route                             | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-----------------------------------|
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, long-term - systemic  | 0.045 mg/m <sup>3</sup>  | 0.026                             |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - systemic | 1.48 mg/m <sup>3</sup>   | 0.28                              |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, short-term - local    | 1.48 mg/m <sup>3</sup>   | 0.109                             |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - inhalative, long-term - local     | 0.045 mg/m <sup>3</sup>  | 0.026                             |
| PROC9 - Transfer of substance or preparation into small containers                                              | Worker - dermal, long-term - systemic      | 0.137 mg/kg bw/d         | 0.549                             |

|                                                                                                                 |                                            |                            |       |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------|-------|
| (dedicated filling line, including weighing)                                                                    |                                            |                            |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, short-term - local        | 0.02 mg/cm <sup>2</sup>    | 0.2   |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - dermal, long-term - local         | 0.02 mg/cm <sup>2</sup>    |       |
| PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | Worker - combined, long-term - systemic    |                            | 0.574 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - systemic  | 0.446 mg/m <sup>3</sup>    | 0.253 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup>    | 0.563 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup>    | 0.22  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - inhalative, long-term - local     | 0.446 mg/m <sup>3</sup>    | 0.253 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - systemic      | 0.02 mg/kg bw/d            | 0.082 |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, short-term - local        | 0.00595 mg/cm <sup>2</sup> | 0.06  |
| PROC15 - Use as laboratory reagent                                                                              | Worker - dermal, long-term - local         | 0.00595 mg/cm <sup>2</sup> |       |
| PROC15 - Use as laboratory reagent                                                                              | Worker - combined, long-term - systemic    |                            | 0.335 |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

**Chemical name** 2-DIMETHYLAMINOETHANOL  
**Pure substance/mixture** Substance  
**REACH registration number** 01-2119492298-24-XXXX  
**CAS No** 108-01-0  
**EC No (EU Index No)** 203-542-8  
**Supplier** Univar Solutions UK Ltd  
 Aquarius House  
 6 Mid Point Business Park  
 Bradford  
 GBR  
  
**Non-Emergency Telephone Number** +44 1274 267300 / +44 1274 267306  
  
**E-mail address** SDS.EMEA@univarsolutions.com

### Section 1 - Title

**Title** Lubricants, greases, release products  
**Type** Worker  
**Main user group** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
**Environmental release category(ies)** ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems  
**Process category(ies)** PROC1 - Use in closed process, no likelihood of exposure  
 PROC2 - Use in closed, continuous process with occasional controlled exposure  
 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  
 PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems  
**Product category(ies)** PC16 - Heat transfer fluids PC17 - Hydraulic fluids PC24 - Lubricants, greases, release products  
**Sector(s) of use** SU0 - Other SU22 - Professional uses

### Section 2 - Operational conditions and risk management measures

#### Section 2.1 - Control of environmental exposure

**Environmental release category(ies)** - ERC9a - Wide dispersive indoor use of substances in closed systems  
 - ERC9b - Wide dispersive outdoor use of substances in closed systems

#### Amounts used

|       |                                       |
|-------|---------------------------------------|
| Type  | Daily amount for wide dispersive uses |
| Value | < 2.75                                |
| Units | kg/d                                  |

#### Product characteristics

|                          |        |
|--------------------------|--------|
| Physical form of product | Liquid |
|--------------------------|--------|

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

|      |               |
|------|---------------|
| Type | Municipal STP |
|------|---------------|

#### Further information

|                        |            |
|------------------------|------------|
| Operational conditions | Indoor use |
|------------------------|------------|

Conditions and measures related to external treatment of waste for disposal

|          |                                                                                           |
|----------|-------------------------------------------------------------------------------------------|
| Disposal | Dispose of this material and its container to hazardous or special waste collection point |
|----------|-------------------------------------------------------------------------------------------|

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control of worker exposure</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                |
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 100 hPa                                                                                                                                                                                                                                                                                                                                                        |
| Temperature associated to vapour pressure                                              | 80°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Provide a basic standard of general ventilation (1 to 3 air changes per hour)<br>Ensure containment of the emission source<br>Ensure segregation of worker from the source                                                                                                                                                                                     |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%<br>Wear suitable face shield<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Use suitable eye protection                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 80°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC1 - Use in closed process, no likelihood of exposure                                                                                                                                                                                                                                                                                                       |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 100 hPa                                                                                                                                                                                                                                                                                                                                                        |
| Temperature associated to vapour pressure                                              | 80°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>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                                                                                          |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Outdoor use                                                                                                                                                                                                                                                                                                                                                    |
| Assumes process temperature up to                                                      | <= 80°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 30%                                                                                                               |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | 1                                                                                                                                                                                                                                                                                                                                                              |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC2 - Use in closed, continuous process with occasional controlled exposure                                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 99%<br>Ensure segregation of worker from the source<br>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                                                               |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |

|                                   |             |
|-----------------------------------|-------------|
| Indoor/Outdoor use                | Outdoor use |
| Assumes process temperature up to | <= 40°C     |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                                                                                                                 |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                                |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                            |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                          |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                              |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                            |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                                 |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 95%                                                                                                                                             |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training<br>Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment<br>Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                                 |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                        |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Use in room with a volume of minimum                                                   | > 300 m3                                                                                                                                                                                                                                                                                                                                                          |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                               |

|                                                                                        |                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities                                                                                                                                            |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                           |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                       |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                     |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                            |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)<br>Efficiency of at least 95%                                                        |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training<br>Efficiency of at least 90% |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment<br>Regular cleaning of work area                                                                                |

|                                                                         |                                                                                                                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report | Avoid contact with contaminated tools and objects                                                                                                                |
| Indoor/Outdoor use                                                      | Outdoor use                                                                                                                                                      |
| Assumes process temperature up to                                       | <= 40°C                                                                                                                                                          |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
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| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 90%                                                                                                                               |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |
| Use in room with a volume of minimum                                                   | > 100 m3                                                                                                                                                                                                                                                                                                                                                       |
| Minimum room ventilation rate for handling/application (air changes per hour)          | > 3                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                        |                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities                                                                                                    |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                               |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                           |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                         |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                             |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 90% |
| Conditions and measures related to personal protection, hygiene and                    | Wear suitable face shield<br>Use suitable eye protection                                                                                                                                                                         |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                |
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| health evaluation                                                           | Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                                                                                  |
| Organisational measures to prevent /limit releases, dispersion and exposure | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report     | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                          | Outdoor use                                                                                                                                                                                                                                                                                                                                                    |
| Assumes process temperature up to                                           | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                                                                                                                                                                                                                                                  |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                                                                                                                                                             |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                                                                                                                                                         |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                                                                                                                                                       |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                                                                                                                                                           |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                                                                                                                                                         |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                                                                                                                                              |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 95%                                                                                                                                                          |
| Conditions and measures related to personal protection, hygiene and health evaluation  | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure            | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report                | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                     | Indoor use                                                                                                                                                                                                                                                                                                                                                     |
| Assumes process temperature up to                                                      | <= 40°C                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                        |                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process category(ies)                                                                  | PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                                                                                                                    |
| Covers concentrations up to                                                            | 5%                                                                                                                                                                                                                               |
| Physical form of product                                                               | Liquid                                                                                                                                                                                                                           |
| Vapour pressure                                                                        | 2140 hPa                                                                                                                                                                                                                         |
| Temperature associated to vapour pressure                                              | 40°C                                                                                                                                                                                                                             |
| Exposure duration                                                                      | Avoid carrying out activities involving exposure for more than 4 hours                                                                                                                                                           |
| Use frequency                                                                          | Covers daily exposures up to 8 hours (unless stated differently).                                                                                                                                                                |
| Technical conditions and measures to control dispersion from source towards the worker | Ensure containment of the emission source Efficiency of at least 90%<br>Ensure segregation of worker from the source<br>Provide a basic standard of general ventilation (1 to 3 air changes per hour) Efficiency of at least 90% |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conditions and measures related to personal protection, hygiene and health evaluation | Wear suitable face shield<br>Use suitable eye protection<br>Wear a full face respirator conforming to EN 136 with Type A filter or better<br>Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 90%                                                                                      |
| Organisational measures to prevent /limit releases, dispersion and exposure           | Ensure operatives are trained to minimise exposures<br>Assumes a good basic standard of occupational hygiene is implemented<br>Regular cleaning of equipment Regular cleaning of work area<br>Demonstrable and effective housekeeping practices are in place<br>Supervision in place to check that the RMMs in place are being used correctly and OCs followed |
| Additional good practice advice beyond the REACH Chemical Safety Report               | Avoid contact with contaminated tools and objects                                                                                                                                                                                                                                                                                                              |
| Indoor/Outdoor use                                                                    | Outdoor use                                                                                                                                                                                                                                                                                                                                                    |
| Assumes process temperature up to                                                     | <= 40'C                                                                                                                                                                                                                                                                                                                                                        |

### Section 3 - Exposure estimation

**Environmental release category(ies) - ERC9a - Wide dispersive indoor use of substances in closed systems  
- ERC9b - Wide dispersive outdoor use of substances in closed systems**

#### Predicted No Effect Concentration (PNEC)

|                            |             |
|----------------------------|-------------|
| Freshwater                 | 0.066 mg/l  |
| Freshwater sediment        | 0.246 mg/kg |
| Marine water               | 0.004 mg/l  |
| Marine sediment            | 0.015 mg/kg |
| Soil                       | 0.01 mg/kg  |
| Impact on Sewage Treatment | 10 mg/l     |
| Intermittent release       | 0.661 mg/l  |

#### Calculation method Used EUSES model

| Environment                 | predicted exposure level | Risk characterisation ratio (RCR) |
|-----------------------------|--------------------------|-----------------------------------|
| Freshwater                  | 0.000749 mg/l            | 0.011                             |
| Freshwater sediment         | 0.00279 mg/kg d.w.       | 0.011                             |
| Marine water                | 0.0000719 mg/l           | 0.018                             |
| Marine sediment             | 0.000268 mg/kg d.w.      | 0.018                             |
| STP: Sewage Treatment Plant | 0.00551 mg/l             | < 0.01                            |
| Soil                        | 0.0000187 mg/kg d.w.     | < 0.01                            |

#### Derived No Effect Level (DNEL):

|                                             |             |
|---------------------------------------------|-------------|
| Worker - dermal, long-term - systemic       | 0.25 mg/kg  |
| Worker - dermal, short-term - local         | 100 µg/cm2  |
| Worker - dermal, short-term - systemic      | 1.2 mg/kg   |
| Worker - inhalative, long-term - local      | 1.76 mg/m³  |
| Worker - inhalative, long-term - systemic   | 1.76 mg/m³  |
| Worker - inhalative, short-term - local     | 13.53 mg/m³ |
| Worker - inhalative, short-term - systemic  | 5.28 mg/m³  |
| Consumer - oral, long-term - systemic       | 0.148 mg/kg |
| Consumer - inhalative, long-term - systemic | 0.438 mg/m³ |

#### Calculation method Used ECETOC TRA model

| Used ART model                                                                |                                            |                             |                                   |
|-------------------------------------------------------------------------------|--------------------------------------------|-----------------------------|-----------------------------------|
| Process category(ies)                                                         | Exposure route                             | predicted exposure level    | Risk characterisation ratio (RCR) |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic  | 0.074 mg/m <sup>3</sup>     | 0.042                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic | 0.297 mg/m <sup>3</sup>     | 0.056                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.074 mg/m <sup>3</sup>     | 0.042                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.297 mg/m <sup>3</sup>     | 0.022                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.00068 mg/kg bw/d          | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.000198 mg/cm <sup>2</sup> |                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.000198 mg/cm <sup>2</sup> | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                             | 0.045                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - systemic  | 0.052 mg/m <sup>3</sup>     | 0.03                              |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - systemic | 0.208 mg/m <sup>3</sup>     | 0.039                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, short-term - local    | 0.208 mg/m <sup>3</sup>     | 0.015                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - inhalative, long-term - local     | 0.052 mg/m <sup>3</sup>     | 0.035                             |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - systemic      | 0.00068 mg/kg bw/d          | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, short-term - local        | 0.000198 mg/cm <sup>2</sup> | < 0.01                            |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - dermal, long-term - local         | 0.000198 mg/cm <sup>2</sup> |                                   |
| PROC1 - Use in closed process, no likelihood of exposure                      | Worker - combined, long-term - systemic    |                             | 0.032                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - systemic  | 0.77 mg/m <sup>3</sup>      | 0.438                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - systemic | 3.08 mg/m <sup>3</sup>      | 0.583                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, short-term - local    | 3.08 mg/m <sup>3</sup>      | 0.228                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - inhalative, long-term - local     | 0.77 mg/m <sup>3</sup>      | 0.438                             |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - systemic      | 0.027 mg/kg bw/d            | 0.11                              |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup>    | 0.04                              |
| PROC2 - Use in closed, continuous process with occasional controlled exposure | Worker - dermal, long-term - local         | 0.004 mg/m <sup>3</sup>     |                                   |

|                                                                                                                                   |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - combined, long-term - systemic    |                          | 0.547 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - inhalative, long-term - systemic  | 0.27 mg/m <sup>3</sup>   | 0.153 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - inhalative, short-term - systemic | 1.08 mg/m <sup>3</sup>   | 0.205 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - inhalative, short-term - local    | 1.08 mg/m <sup>3</sup>   | 0.08  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - inhalative, long-term - local     | 0.27 mg/m <sup>3</sup>   | 0.153 |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - dermal, long-term - systemic      | 0.027 mg/kg bw/d         | 0.11  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - dermal, short-term - local        | 0.004 mg/cm <sup>2</sup> | 0.04  |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - dermal, long-term - local         | 0.004 mg/cm <sup>2</sup> |       |
| PROC2 - Use in closed, continuous process with occasional controlled exposure                                                     | Worker - combined, long-term - systemic    |                          | 0.263 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - systemic  | 0.155 mg/m <sup>3</sup>  | 0.088 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - systemic | 2 mg/m <sup>3</sup>      | 0.379 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - local    | 2 mg/m <sup>3</sup>      | 0.148 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - local     | 0.155 mg/m <sup>3</sup>  | 0.088 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic      | 0.155 mg/kg bw/d         | 0.658 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/cm <sup>2</sup> | 0.12  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/cm <sup>2</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging)                                                              | Worker - combined, long-term - systemic    |                          | 0.746 |

|                                                                                                                                   |                                            |                          |       |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------|
| from/to vessels/large containers at non dedicated facilities                                                                      |                                            |                          |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - systemic  | 0.205 mg/m <sup>3</sup>  | 0.116 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - systemic | 1.66 mg/m <sup>3</sup>   | 0.314 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, short-term - local    | 1.66 mg/m <sup>3</sup>   | 0.123 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - inhalative, long-term - local     | 0.205 mg/m <sup>3</sup>  | 0.116 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - systemic      | 0.165 mg/kg bw/d         | 0.658 |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/cm <sup>2</sup> | 0.12  |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/cm <sup>2</sup> |       |
| PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities | Worker - combined, long-term - systemic    |                          | 0.775 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - systemic  | 0.052 mg/m <sup>3</sup>  | 0.03  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - systemic | 0.4 mg/m <sup>3</sup>    | 0.076 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, short-term - local    | 0.4 mg/m <sup>3</sup>    | 0.03  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - inhalative, long-term - local     | 0.052 mg/m <sup>3</sup>  | 0.03  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, long-term - systemic      | 0.165 mg/kg bw/d         | 0.658 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities     | Worker - dermal, short-term - local        | 0.012 mg/cm <sup>2</sup> | 0.12  |

|                                                                                                                               |                                            |                         |       |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| dedicated facilities                                                                                                          |                                            |                         |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/cm2            |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.688 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term - systemic  | 0.041 mg/m <sup>3</sup> | 0.023 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term - systemic | 0.324 mg/m <sup>3</sup> | 0.061 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, short-term - local    | 0.324 mg/m <sup>3</sup> | 0.024 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - inhalative, long-term - local     | 0.041 mg/m <sup>3</sup> | 0.023 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - systemic      | 0.165 mg/kg bw/d        | 0.658 |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, short-term - local        | 0.012 mg/cm2            | 0.12  |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - dermal, long-term - local         | 0.012 mg/cm2            |       |
| PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | Worker - combined, long-term - systemic    |                         | 0.681 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                 | Worker - inhalative, long-term - systemic  | 0.446 mg/m <sup>3</sup> | 0.253 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                 | Worker - inhalative, short-term - systemic | 2.971 mg/m <sup>3</sup> | 0.563 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                 | Worker - inhalative, short-term - local    | 2.971 mg/m <sup>3</sup> | 0.22  |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                 | Worker - inhalative, long-term - local     | 0.446 mg/m <sup>3</sup> | 0.253 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems                                 | Worker - dermal, long-term - systemic      | 0.021 mg/kg bw/d        | 0.082 |
| PROC20 - Heat and pressure transfer                                                                                           | Worker - dermal, short-term -              | 0.00299 mg/cm2          | 0.03  |

|                                                                                               |                                            |                         |       |
|-----------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|-------|
| fluids in dispersive, professional use but closed systems                                     | local                                      |                         |       |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - dermal, long-term - local         | 0.00299 mg/cm2          |       |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - combined, long-term - systemic    |                         | 0.335 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - inhalative, long-term - systemic  | 0.624 mg/m <sup>3</sup> | 0.355 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - inhalative, short-term - systemic | 4.16 mg/m <sup>3</sup>  | 0.788 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - inhalative, short-term - local    | 4.16 mg/m <sup>3</sup>  | 0.307 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - inhalative, long-term - local     | 0.624 mg/m <sup>3</sup> | 0.355 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - dermal, long-term - systemic      | 0.021 mg/kg bw/d        | 0.082 |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - dermal, short-term - local        | 0.00299 mg/cm2          | 0.03  |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - dermal, long-term - local         | 0.00299 mg/cm2          |       |
| PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems | Worker - combined, long-term - systemic    |                         | 0.437 |

#### **Section 4 - Guidance to check compliance with the exposure scenario**

Used ECETOC TRA model. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.