



## SAFETY DATA SHEET

According to (EC) 1907/2006

**ETHYLENEDIAMINE 50% (EDA50%)**

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### 1. IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY UNDERTAKING

#### 1.1 Product identifier

Trade name	Allamine EDA50
Substance name	Ethylenediamine 50%
Registration number	01-2119480383-37-0000
CAS number	107-15-3
EC number	203-468-6
Product code	5405288
Synonyms	Dimethylenediamine 50% 1,2 Diaminoethane 50%

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

Uses advised against	No information
Applications of the substance	Intermediate in manufacture of sequestering agents, fungicides, textile resins and polyamide resins. Metal treatment

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

Supplier: Alliance Chemicals Limited Old Walls, Chapel Lane, Penselwood, BA9 8LY United Kingdom Telephone: +44 (0) 1747841222 Email: <a href="mailto:sj@alliancechemicals.com">sj@alliancechemicals.com</a>
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#### 1.4 Emergency telephone number

+44 (0) 7802567401 (8.00 AM – 8.00 PM)
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**2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture**

<b>Classification (regulation (EC) No 1272/2008)</b>	<b>Skin Corrosion, category 1B, H314 Respiratory Sensitisation, category 1B, H334 Skin Sensitisation, category 1B, H317 Chronic aquatic toxicity, category 3, H412</b>
<b>Classification (67/548/EEC, 1999/45/EC) Hazard category:</b>	<b>Corrosive, C, R34 Harmful, Xn, R42/43 Sensitising, Xn, R42/43</b>
<b>Risk advice to man and the environment</b>	<b>Causes burns. Harmful in contact with skin and if swallowed. May cause sensitisation by inhalation and skin contact.</b>

For a full text of H-Statements mentioned in this Section, see Section 16.

**2.2 Label elements**

<b>Label (regulation (EC) 1272/2008:</b>	
<b>Pictogram</b>	
<b>Signal word</b>	<b>Danger</b>
<b>Hazard statements</b>	<b>H226 Flammable liquid and vapour H302 + H332 Harmful if swallowed or inhaled H311 Toxic in contact with the skin H314 Causes severe burns and eye damage. H317 May cause an allergic skin reaction. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H412 Harmful to aquatic life with long lasting effects</b>

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<p><b>Risk phrases</b></p>	<p><b>R10:</b> Flammable <b>R21/22</b> Harmful in contact with skin and if swallowed <b>R34:</b> Causes burns <b>R42/43:</b> May cause sensitisation by inhalation and skin contact</p>
<p><b>Safety phrases</b></p>	<p><b>S23:</b> Do not breath fumes <b>S26:</b> In case of contact with eyes, rinse immediately with plenty of water and seek medical advice <b>S36/37/39:</b> Wear suitable eye/face protection, protective gloves, protective clothing <b>S45:</b> In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible) <b>S63:</b> In case of accident by inhalation, remove victim to fresh air and keep at rest</p>
<p><b>Precautionary statements</b></p>	<p><b>Prevention:</b> <b>P261</b> Avoid breathing dust/ fumes/ gas/ mist/ vapour/ spray. <b>P280</b> Wear protective gloves/ protective clothing/ face protection/ eye protection. <b>P285</b> In case of inadequate ventilation wear respiratory protection.  <b>Response:</b> <b>P303 + P361 + P353</b> <b>IF ON SKIN (or hair):</b> Remove/ take off immediately all contaminated clothing. Rinse skin with water/ shower <b>P305 + P351 + P338</b> <b>IF IN EYES:</b> Rinse cautiously with water for several minutes. <b>+ P310</b> Remove contact lenses, if present and easy to do. Continue rinsing. <b>P304 + P340 + P310</b> <b>IF INHALED:</b> Remove person to fresh air and keep comfortable for breathing. <b>P342 + P 311</b> If experiencing respiratory symptoms: Call a <b>POISON CENTER</b> or doctor/ physician.</p>
<p><b>Hazardous components which must be listed on the label:</b></p>	<p>Ethylenediamine 50% 107-15-3</p>

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**2.3 Other hazards**

<b>No further data available</b>	
<b>PBT and vPvB assessment:</b>	<b>This substance/ mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.</b>

**3. COMPOSITION/ INFORMATION ON INGREDIENTS****3.1 Substances**

<b>Hazardous Substance</b>					
<b>Chemical Name</b>	<b>PBT vPvB -OEL</b>	<b>CAS-No. EC-No. REACH No.</b>	<b>Classification (REGULATION (EC) No 1272/2008)</b>	<b>Classification (67/548/EEC)</b>	<b>Conc %</b>
Ethylenediamine		107-15-3 203-468-6 01-2119480383 -37-0000	Flam. Liq. 3; H226 Acute Tox. 4; H302 Acute Tox. 4; H3132 Acute Tox. 3; H311 Skin Corr. 1B; H314 Resp. Sens. 1; H334 Skin Sens. 1; H317	R10 C; 34 Xn; R20/R21/22 Sens: R42/43	50
<b>Non Hazardous Substance:</b>					
Water		7732-18-5 231-791-2			10

For the full text of H-Statements mentioned in this Section, see Section 16.

For the full text of R-Phrases mentioned in this Section, see Section 16.

**REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59)**  
Not applicable.

**4. FIRST AID MEASURES****4.1 Description of first aid measures**

<b>General Advice</b>	<b>Immediately seek medical attention. Move out of dangerous area. Show this safety data sheet to the doctor in attendance.</b>
<b>If inhaled</b>	<b>Remove to fresh air immediately. If not breathing give artificial respiration. Consult physician after significant exposure.</b>
<b>In case of skin contact</b>	<b>Remove contaminated clothes and shoes. Immediately flush with water for at least 15 minutes. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. Take immediately to hospital.</b>
<b>In case of eye contact</b>	<b>Immediately rinse with water for at least 15 minutes holding the eyelids apart. Get medical attention. Remove contact lenses. Protect unharmed eye. Small amounts splashed into eye can cause irreversible tissue damage and blindness.</b>
<b>If swallowed</b>	<b>Wash mouth out with water and then drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention immediately. DO NOT induce vomiting! May cause chemical burns in mouth and throat.</b>

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

<b>Symptoms:</b>	<b>The symptoms and effects are expected from the hazards as shown in Section 2. No specific product related symptoms are known.</b>
<b>Risks:</b>	<b>Harmful if swallowed or inhaled. Toxic in contact with skin. May cause an allergic skin reaction. Causes serious eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes severe burns.</b>

**4.3 Indication of any immediate medical and special treatment needed**

<b>Symptomatic treatment. If in doubt get medical attention immediately</b>
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## 5. FIRE FIGHTING MEASURES

### 5.1 Extinguishing media

Suitable extinguishing agents	Carbon dioxide (CO <sub>2</sub> ), water spray, alcohol-resistant foam, dry chemical powder.
For safety reasons unsuitable extinguishing agents:	No information available.

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

Special hazards during firefighting/ Specific hazards arising from the chemical	Water spray may be ineffective unless used by experienced firefighters. Do not allow run-off from firefighting to enter drains of water courses.
Combustion products	Carbon oxides. Nitrogen oxides (NO <sub>x</sub> ).

### 5.3 Advice for firefighters

Special protective equipment for firefighters	Wear self-contained breathing apparatus and protective suit/ eye protection.
Additional information	Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire cans should be stored separately in closed containments.

## 6. ACCIDENTAL RELEASE MEASURES

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

Ensure adequate ventilation. Wear protective clothing. Use respiratory protective device against the effects of fumes/dust/aerosol. Remove all incompatible materials and sources of ignition.
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### 6.2 Environmental precautions

Do not allow the product to penetrate the ground/soil. Do not allow the product to reach any water course/ sewage systems. If the product contaminates water courses/ sewage systems inform the respective authorities.
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### 6.3 Methods for cleaning up/ Methods for containment

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations.

### 6.4 Reference to other sections

For personal protection see section 8.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Advise on safe handling:

For personal protection see Section 8.  
Do not breath vapours or spray mist.  
Avoid contact with skin and eyes.  
Persons with a history of skin sensitisation problems, or asthma, allergies, chronic of recurrent respiratory disease should not be employed in any process in which this mixture is being used.  
Smoking, eating or drinking should be prohibited in the application area.  
Provide sufficient air exchange and/ or exhaust in work rooms.  
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion:

Avoid formation of aerosol.  
Keep away from sources of ignition – No Smoking.

### 7.2 Conditions for safe storage including any incompatibilities

Requirements for storage areas and containers:	No Smoking. Keep contained tightly closed in a dry and well ventilated place. Reacts with copper, aluminium, zinc and their alloys. Electrical installations/ working materials must comply with the technological safety standards.
Information about storage in one common storage facility:	Store away from feedstuffs or foodstuffs Avoid incompatible materials and conditions
Other data:	No decomposition if stored and applied as directed.

### 7.3 Specific end use(s)

No special requirement

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**8. EXPOSURE CONTROLS/ PERSONAL PROTECTION**

**8.1 Control parameters**

**Hazardous ingredients: 1,2-DIAMINOETHANE**

**Components with workplace control parameters**

**Contains no substances with occupational exposure limit values.**

**DNEL (Derived No Effect Level)/ PNEC (Predicted No Effect Concentration) values according to Regulation (EC) No. 1907/2006**

Type	Exposure	Value	Population	Effect
DNEL	Dermal	10 g/l	Workers	Acute local
DNEL	Dermal	3.6 mg/Kg bw/day	Workers	Long-term systemic
DNEL	Inhalation	25 mg/ m3	Workers	Long-term systemic
PNEC	Fresh water	0.016 mg/l	-	-
PNEC	Marine water	0.002 mg/l	-	-
PNEC	Fresh water sediment	7.68 mg/ Kg dry weight	-	-
PNEC	Marine sediment	0.768 mg/ Kg dry weight	-	-
PNEC	Soil	4.36 mg/ Kg dry weight	-	-
PNEC	Sewage treatment plant	0.5 mg/l	-	-

**8.2 Exposure controls**

<b>Engineering controls</b>	<b>Effective exhaust ventilation system. Ensure that eyewash stations and safety showers are close to the workstation location.</b>
<b>Personal Protective equipment</b>	
<b>Respiratory protection:</b>	<b>In case of vapour formation use a respirator with an approved filter. Gas/ vapour filter, type K: ammonia and derivatives (EN141)</b>
<b>Hand protection:</b>	<b>Butyl-rubber gloves.</b>
<b>Eye protection:</b>	<b>Tight fitting safety goggles. Face-shield</b>
<b>Skin and body protection:</b>	<b>Protective suit</b>
<b>Hygiene measures:</b>	<b>Avoid contact with skin, eyes and clothing. When using do not eat, drink or smoke. Wash hands before break and end of work day. Wash contaminated clothing before re-use</b>
<b>Environmental exposure controls</b>	
<b>General advice</b>	<b>Prevent product from entering drains and waterways. If contamination occurs inform respective authorities.</b>



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### 9. PHYSICAL AND CHEMICAL PROPERTIES

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

<b>Appearance:</b>	<b>Form:</b> <b>Colour:</b> <b>Odour:</b> <b>Odour threshold:</b>	<b>Liquid</b> Colourless to light yellow Ammonical No data available
<b>Safety data:</b>	<b>pH -</b> <b>Melting point -</b> <b>Boiling point -</b> <b>Flash point -</b> <b>Ignition temperature –</b> <b>Evaporation rate –</b> <b>Flammability -</b> <b>Lower explosion limit –</b> <b>Upper explosion limit -</b> <b>Vapour pressure -</b> <b>Relative vapour pressure –</b> <b>Relative density –</b> <b>Water solubility –</b> <b>Solubility in other solvents –</b> <b>Partition coefficient –</b> <b>Auto ignition temperature –</b> <b>Decomposition temperature-</b> <b>Viscosity –</b> <b>Explosive properties –</b> <b>Oxidizing properties –</b>	<b>12.8 @ 25% solution (20°C).</b> ~ -22°C No data available >100°C (tag closed cup). Not determined. Not determined. Flammable. No data available No data available No data available No data available No data available Miscible in all proportions (20°C). Miscible with ethanol, acetone and ether. Not determined. No data available Not determined. No data available Not explosive. Not classified as oxidizing.
This safety data only contains information relating to safety and does not replace any product information or product specification		

#### 9.2 Other information

No further relevant information is available.

### 10. STABILITY AND REACTIVITY

#### 10.1 Reactivity

Stable under normal conditions.

#### 10.2 Chemical stability

Stable under recommended storage conditions (see Section 7). Stable under normal temperatures and pressures.

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### 10.3 Possibility of hazardous reactions

Heating can release hazardous gases.
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### 10.4 Conditions to avoid

Conditions to avoid:	Heat, flames and sparks. Avoid contact with strong oxidizers. Fire or intense heat may cause violent rupture of package.
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### 10.5 Incompatible materials

Materials to avoid:	Reacts strongly with concentrated acids and chlorohydrocarbons. Attacks copper and copper alloys. Reacts strongly with oxidizers.
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### 10.6 Hazardous decomposition products

Hazardous decomposition products:	Hazardous decomposition will produce carbon monoxide and/or carbon dioxide. Nitrogen oxides (NO <sub>x</sub> ).
Thermal decomposition:	No data available.

## 11. TOXICOLOGICAL INFORMATION

### Product Information:

Hazard Summary	
Inhalation:	Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Inhalation of aerosols may cause irritation to mucous membranes.
Skin:	Symptoms may be delayed. Toxic in contact with skin. May cause an allergic skin reaction. Causes severe skin burns.
Eyes:	Causes serious eye damage.
Ingestion:	Harmful if swallowed. Corrosive to the digestive tract. Causes burns.

### Toxicological Assessment

Further information: Solvents may degrease the skin.

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**11.1 Information on toxicological effects**

Toxicological data for the components:

Test result ethylenediamine	
Acute oral toxicity:	LD50: > 300-2,000 mg/ Kg (rat).
Acute inhalation toxicity:	LD50: > 10-20 mg/l (rat). Exposure time 4h. Test atmosphere: vapour.
Acute dermal toxicity:	LD50: > 200-1000 mg/ Kg (rabbit).
Skin irritation:	Result: Causes burns.
Sensitisation:	Result: The product is a skin sensitiser, sub-category 1B. Result: The product is a respiratory sensitiser, sub-category 1B.
Germ cell mutagenicity	
Genotoxicity in vitro:	Result: No evidence of genotoxic effects in vitro.
Genotoxicity in vivo:	Result: No evidence of genotoxic effect in vivo.

**12. ECOLOGICAL INFORMATION**

Product Information:

Ecotoxicology Assessment	
Additional ecological information:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

**12.1 Toxicity**

Ecotoxicology Assessment			
Product/ ingredient name	Result	Species	Exposure
Ethylenediamine	EC50: 3.2 g/l.	Micro-organism	2 hours
	NOEC: 0.5 g/l.	Micro-organism	2 hours
	Acute EC50: 645 mg/l Fresh water.	Algae	72 hours
	Acute EC50: 16.7 mg/l Fresh water.	Daphnia	48 hours
	Acute LC50: 640 mg/l fresh water.	Fish	96 hours
	Acute NOEC: 3.2 mg/l Fresh water.	Algae	72 hours
	Chronic NOEC: 0.16 mg/l Fresh water	Daphnia	21 days
	Chronic NOEC: 10 mg/l Fresh water	Fish	28 days

Conclusions/ Summary: PNEC Intermittent release = 0.167 mg/l (ethylenediamine)

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### 12.2 Persistence and degradability

Ethylenediamine	
Biodegradability:	Result: Readily biodegradable. >60% BOD, 28 days, Closed Bottle Test (OECD 301D).

### 12.3 Bioaccumulative potential

Ethylenediamine	
Bioaccumulation:	Not expected considering the low log Pow value.

### 12.4 Mobility in soil

Ethylenediamine	
Mobility:	The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected. Groundwater contamination is unlikely.

### 12.5 Results of PBT and vPvB assessment

Ethylenediamine	
PBT and VPvB assessment:	This substance is not considered to be PBT (Persistent, Bioaccumulative, Toxic) This substance is not considered to be vPvB (very Persistent nor very Bioaccumulative)

### 12.6 Other adverse effects

Ethylenediamine	
Biochemical Oxygen Demand (BOD):	No data available

<p>Harmful to fauna. Do not allow to enter watercourses or soils. Large doses cause high/ low pH which may affect effluent and sewage treatment processes. Discharge of large quantities may kill fish and other aquatic life due to increase/ decrease in ph. Harmful to aquatic organisms. Spillage in sewers or waterways must be avoided.</p>
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**13. DISPOSAL CONSIDERATIONS**

**13.1 Waste treatment methods**

<b>Product</b>	<b>This product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Hazardous waste</b>
<b>Contaminated packaging:</b>	<b>Contaminated packaging must not be treated as household waste. Dispose of in accordance with regional or national regulations. Do not burn, or use a cutting torch, on the empty packaging.</b>

**14. TRANSPORT INFORMATION**

<b>14.1 UN Number</b>	
<b>ADR:</b>	<b>1604</b>
<b>RID:</b>	<b>1604</b>
<b>IMDG-Code:</b>	<b>1604</b>
<b>IATA-DGR:</b>	<b>1604</b>
<b>14.2 Proper Shipping Name</b>	
<b>ADR:</b>	<b>ETHYLENEDIAMINE</b>
<b>RID:</b>	<b>ETHYLENEDIAMINE</b>
<b>IMDG-Code:</b>	<b>ETHYLENEDIAMINE</b>
<b>IATA-DGR:</b>	<b>Ethylenediamine.</b>
<b>14.3 Transport Hazard Class</b>	
<b>ADR:</b>	<b>8 (3)</b>
<b>RID:</b>	<b>8 (3)</b>
<b>IMDG-Code:</b>	<b>8 (3)</b>
<b>IATA-DGR:</b>	<b>8 (3)</b>
<b>14.4 Packing Group</b>	
<b>ADR:</b>	
<b>Packaging Group:</b>	<b>11</b>
<b>Classification Code:</b>	<b>CF1</b>
<b>Hazard Identification No:</b>	<b>83</b>
<b>Labels:</b>	<b>8 (3)</b>
<b>Tunnel Restriction Code:</b>	<b>Full load, Tank-container, (D/E).</b>
<b>RID:</b>	
<b>Packaging Group:</b>	<b>11</b>
<b>Classification Code:</b>	<b>CF1</b>
<b>Hazard Identification No:</b>	<b>83</b>
<b>Labels:</b>	<b>8 (3)</b>
<b>IMDG-Code:</b>	
<b>Packaging Group:</b>	<b>11</b>
<b>Labels:</b>	<b>8 (3)</b>
<b>EmS Code:</b>	<b>F-E, S-C</b>
<b>IATA:</b>	
<b>Packing Instruction (Cargo Aircraft):</b>	<b>855</b>
<b>Packaging Group:</b>	<b>11</b>
<b>Labels:</b>	<b>8 (3)</b>

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<b>14.5 Environmental Hazards</b>	
<b>ADR:</b>	
<b>Environmentally Hazardous:</b>	<b>No.</b>
<b>RID:</b>	
<b>Environmentally Hazardous:</b>	<b>No.</b>
<b>IMDG-Code:</b>	
<b>Marine Pollutant:</b>	<b>No.</b>
<b>IATA-DGR:</b>	
<b>Environmentally Hazardous:</b>	<b>No.</b>

**14.6 Special precautions for user:**

Not applicable.

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:**

Not applicable for product as supplied.

**15. REGULATORY INFORMATION****15.1 Safety, health and environmental regulations/ legislation specific for the substance or mixture**

<b>Ethylenediamine</b>	
<b>Major Accident Hazard Legislation:</b>	<b>ZEU SEVES3 FLAMMABLE LIQUIDS P5c Quantity 1: 5,000 t. Quantity 2: 50,000 t.</b>
<b>Water Contaminating Class (Germany):</b>	<b>WGK 2 water endangering.</b>
<b>REACH – Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)</b>	
<b>EU REACH – Annex XVII:</b>	<b>Banned and/or restricted: • Ethylendiamine</b>
<b>Notification Status:</b>	
<b>CH INV:</b>	<b>YES. On the inventory, or in compliance with the inventory.</b>
<b>TSCA:</b>	<b>YES. All chemical substances in this product are either listed on the TSCA inventory or in compliance with a TSCA inventory exemption.</b>
<b>DSL:</b>	<b>YES. The ethylenediamine component of this product is on the Canadian DSL list.</b>
<b>AICS:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>NZIoC:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>ENCS:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>

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<b>ISHL:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>KECI:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>PICCS:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>IECSC:</b>	<b>YES. Ethylenediamine is on the inventory, or in compliance with the inventory.</b>
<b>Further Information:</b>	
<b>This product is to be considered a substance according to EU-legislation.</b>	
<b>Chemical Safety Assessment:</b>	
<b>Ethylenediamine:</b>	<b>A chemical safety assessment has been carried out for this substance.</b>

**16. OTHER INFORMATION**

<b>Full Text Of H-Statements Referred To Under Sections 2 And 3</b>	
<b>H226:</b>	<b>Flammable liquid and vapour.</b>
<b>H302:</b>	<b>Harmful if swallowed.</b>
<b>H311:</b>	<b>Toxic in contact with skin.</b>
<b>H314:</b>	<b>Causes severe burns and eye damage.</b>
<b>H317:</b>	<b>May cause an allergic skin reaction.</b>
<b>H318:</b>	<b>Causes serious eye damage.</b>
<b>H332:</b>	<b>Harmful if inhaled.</b>
<b>H334:</b>	<b>May cause allergy or asthma symptoms or breathing difficulties if inhaled.</b>
<b>Full Text Of R-Phrases Referred To Under Sections 2 And 3</b>	
<b>R10:</b>	<b>Flammable.</b>
<b>R20/21/22:</b>	<b>Harmful by inhalation, in contact with skin, or if swallowed.</b>
<b>R34:</b>	<b>Causes burns.</b>
<b>R42/43:</b>	<b>May cause sensitisation by inhalation and skin contact.</b>
<b>Explanation For Possible Abbreviations Mentioned In Section 2</b>	
<b>PBT:</b>	<b>Persistent, bioaccumulative and toxic.</b>
<b>vPvB:</b>	<b>Very persistent and very bioaccumulative.</b>
<b>OEL:</b>	<b>Occupational exposure limit.</b>

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**Annex:**

Use as an intermediate  
Industrial formulation  
Industrial use as a processing aid  
Industrial use, processing aid/ scavenging agent in refinery streams/ corrosion inhibitors  
Heat and pressure transfer fluids in dispersive, professional use but closed systems  
Monomer used in epoxy, PU, adhesives, coatings and other polymers, Industrial  
Monomer used in epoxy, PU, adhesives, coatings and other polymers, Professional

**1/. Short title of Exposure Scenario: Use as an intermediate**

**Main User Groups** : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental Release Categories** : ERC6a, ERC6c: Industrial use resulting in the manufacture of another substance (use of intermediates), Industrial use of monomers for manufacture of thermoplastics  
**Process Categories** : 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 or other process (synthesis) where opportunity for exposure arises  
PROC15: Use as a laboratory reagent

**2.1/. Contributing scenario controlling environmental exposure for: ERC6a, ERC6c: Industrial use resulting in the manufacture of another substance (use of intermediates), Industrial use of monomers for manufacture of thermoplastics**

**Amount used**

Maximum daily site tonnage : 500 kg/day  
Fraction of EU tonnage used in region : 100%  
Fraction of Regional tonnage used locally : 1%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10  
Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 220  
Emission or Release Factor: Air : 0.1%  
Emission or Release Factor: Water : 0.7%  
Emission or Release Factor: Soil : 0%  
Additional risk management : 92%  
Measures for water remarks : For example, incineration, ion exchange processes  
Technical conditions and measures/  
Organisational measures Exposure time : Continuous use. Release

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

Type of Sewage Treatment Plant : Sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%



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**2.2/. Contributing scenario controlling worker exposure for : PROC1: Use in closed process, no likelihood of exposure**

Activity : General exposures, (closed systems)

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Outdoor/ Indoor : Outdoor

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.3/. Contributing scenario controlling worker exposure for: PROC2: Used in closed, continuous process with occasional controlled exposure**

Activity : General exposures, Continuous process, (open systems)

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

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**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.4/. Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**

**Activity** : Use in contained batch processes

**Product characteristics**

**Concentration of the substance in Mixture/  
Article** : Covers the percentage of the substance in the product up to 100% (unless stated differently)  
**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 240 min  
**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Technical conditions and measures**

Local exhaust ventilation is required at any step if there is opportunity for significant Exposure (Effectiveness (of a measure): 90%)

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.5/. Contributing scenario controlling worker exposure for: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**

**Activity** : Use in contained batch processes, Process sampling

**Product characteristics**

**Concentration of the substance in Mixture/  
Article** : Covers the percentage of the substance in the product up to 100% (unless stated differently)  
**Physical Form (at time of use)** : liquid

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**Frequency and duration of use**

Exposure duration : > 240 min  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur (Effectiveness (of a measure): 90%)

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

<b>2.6/. Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent</b>
---

**Activity** : Laboratory activities

**Frequency and duration of use**

Exposure duration : > 240 min  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur (Effectiveness (of a measure): 90%)

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	EUSES		Fresh water		0.014 mg/L	0.86
			Fresh water sediment		6.613 mg/ kg dry weight	0.86
			Marine water		0.001 mg/L	0.688
			Marine sediment		0.66 mg/ kg dry weight	0.859
			Sewage treatment plant		0.134 mg/ L	0.269
			Soil		1.176 mg/ kg dry weight	0.27

**Workers**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA v3.0		Long term inhalation	0.025 mg/m <sup>3</sup>	<0.01
			Long term dermal	0.002 mg/kg bw/day	<0.01
PROC2	ECETOC TRA v3.0		Long term inhalation	1.252 mg/m <sup>3</sup>	0.05
			Long term dermal	0.068 mg/kg bw/day	0.019
PROC3	ECETOC TRA		Long term inhalation	2.504 mg/m <sup>3</sup>	.1
			Long term dermal	0.034 mg/kg bw/day	<0.01
PROC4	ECETOC TRA v3.0		Long term inhalation	5.008 mg/m <sup>3</sup>	0.2
			Long term dermal	0.343 mg/kg bw/day	0.095
PROC15	ECETOC TRA v3.0		Long term inhalation	1.502 mg/m <sup>3</sup>	0.06
			Long term dermal	0.01 mg/kg bw/day	<0.01

**ERC6a: Industrial use resulting in manufacture of another substance (use of Intermediates)**

**ERC6c: Industrial use of monomers for the manufacture of thermoplastics**

**PROC1: Use in closed process, no likelihood of exposure**

**PROC15: Use as a laboratory reagent**

**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**

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4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult the Internet site: Downstream Users  
[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)

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**1/. Short title of Exposure Scenario: Industrial formulation**

**Main User Groups** : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

**Environmental Release Categories** : ERC2: Formulation of preparations

**Process Categories** : PROC3: Use in closed batch process (synthesis or formulation)  
PROC4: Use in batch or other process (synthesis) where opportunity for exposure arises  
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  
PROC9: transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
PROC15: Use as a laboratory reagent

**2.1/. Contributing scenario controlling environmental exposure for: ERC2: Formulation or preparations**

**Amount used**

Maximum daily site tonnage : 6300 kg/day  
Fraction of EU tonnage used in region : 100%  
Fraction of Regional tonnage used locally : 10%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10  
Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 220  
Emission or Release Factor: Air : 0.03%  
Emission or Release Factor: Water : 0.05%  
Emission or Release Factor: Soil : 0.01%  
Remarks : spERC: ESVOC SpERC 2.2.v1  
Additional risk management : 90%  
Measures for water remarks : For example, incineration, ion exchange processes

**Technical conditions and measures/**

**Organisational measures**

Exposure time : Continuous use/release

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

Type of Sewage Treatment Plant : Sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%

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**2.2/. Contributing scenario controlling worker exposure for : PROC3: Use in closed batch process (synthesis or formulation)**

**Activity** : Use in contained batch processes

**Product characteristics**

**Concentration of the substance in Mixture/**

**Article** : Covers the percentage of the substance in the product up to 100% (unless stated differently)

**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 240 min

**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%)

**2.3/. Contributing scenario controlling worker exposure for: PROC4: Used in batch and other process (synthesis) where opportunity for exposure arises**

**Activity** : Use in contained batch processes, Process sampling

**Product characteristics**

**Concentration of the substance in Mixture/**

**Article** : Covers the percentage of the substance in the product up to 100% (unless stated differently)

**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 240 min

**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palm of both hands (480 cm<sup>2</sup>)

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Other operational conditions affecting workers exposure  
Outdoor/ Indoor : Indoor

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.4/. Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)**

Activity : Use in contained batch processes

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Ventilation rate per hour : 1

Remarks : Any Room size

**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 50%)

Use in contained systems (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%



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**2.5/. Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

**Activity** : Drum/batch transfers/ Bulk transfers

**Product characteristics**  
Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)  
Physical Form (at time of use) : liquid

**Frequency and duration of use**  
Duration of activity : < 15 min  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**  
Dermal exposure : Both hands (960 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**  
Outdoor/ Indoor : Indoor  
Mass transfer rate : 1-10 L/min

**Exposure routes**  
Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**  
Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**  
Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.6/. Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at facilities**

**Activity** : Drum/batch transfers/ Bulk transfers

**Product characteristics**  
Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)  
Physical Form (at time of use) : liquid

**Frequency and duration of use**  
Duration of activity : 1-4 h  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**  
Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**  
Outdoor/ Indoor : Indoor

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**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 95%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.7/. Contributing scenario controlling worker exposure for: PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**

**Activity** : Drum and small package filling, Small package filling

**Product characteristics**

**Concentration of the substance in Mixture/ Article** : Covers the percentage of the substance in the product up to 5%  
**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Duration of activity** : 1-4 h  
**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

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**2.8/. Contributing scenario controlling worker exposure for: PROC15: Use as a laboratory reagent**

**Activity** : Laboratory activities

**Product characteristics**  
 Concentration of the substance in Mixture/  
 Article : Covers the percentage of the substance in the product up to 100% (unless stated differently)  
 Physical Form (at time of use) : liquid

**Frequency and duration of use**  
 Duration of activity : <240 min  
 Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**  
 Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**  
 Outdoor/ Indoor : Indoor

**Technical conditions and measures**  
 Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**  
 Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**  
 Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC2	EUSES		Fresh water		0.015 mg/L	0.965
			Fresh water sediment		7.414 mg/ kg dry weight	0.965
			Marine water		0.002 mg/L	0.77
			Marine sediment		0.74 mg/ kg dry weight	0.965
			Sewage treatment plant		0.151 mg/ L	0.302
			Soil		1.322 mg/ kg dry weight	0.303

Component:  
Version:  
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#### Workers

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC3	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.034 mg/kg bw/day	<0.01
PROC4	ECETOC TRA v3.0		Long term inhalation	5.008 mg/m <sup>3</sup>	0.2
			Long term dermal	0.343 mg/kg bw/day	0.095
PROC5	ART		Long term inhalation	2.6 mg/m <sup>3</sup>	.104
	ECETOC TRA v3.0		Long term dermal	0.686 mg/kg bw/day	0.19
PROC8a	ART		Long term inhalation	3.1 mg/m <sup>3</sup>	0.124
	ECETOC TRA v3.0		Long term dermal	0.069 mg/kg bw/day	0.019
PROC8b	ART		Long term inhalation	1.878 mg/m <sup>3</sup>	0.075
	ECETOC TRA v3.0		Long term dermal	0.411 mg/kg bw/day	0.114
PROC9	ECETOC TRA v3.0		Long term inhalation	1.502 mg/m <sup>3</sup>	0.06
			Long term dermal	0.041 mg/kg bw/day	0.011
PROC15	ECETOC TRA v3.0		Long term inhalation	1.502 mg/m <sup>3</sup>	0.06
			Long term dermal	0.01 mg/kg bw/day	<0.01

**ERC2: Formulation of preparation**

**PROC15: Use as a laboratory reagent**

**PROC3: Use in closed batch process (synthesis or formulation)**

**PROC4: Use in batch and other process (synthesis) where opportunity for exposure Arises**

**PROC5: Mixing or blending in batch processes for formulation of preparations and Articles (multistage and/or significant contact)**

**PROC8a: Transfer of substance or preparation (charging/discharging) from/to Vessels/ large containers at non-dedicated facilities**

**PROC8b: Transfer of substance or preparation (charging/discharging) from/to Vessels/ large containers at facilities**

**PROC9: Transfer of substance or preparation into small containers (dedicated Filling line, including weighing)**

4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario
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For further information, please also consult the Internet site: Downstream Users

[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)

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**1/. Short title of Exposure Scenario: Industrial use as a processing aid**

**Main User Groups** : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites  
**Environmental Release Categories** : ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems  
**Process Categories** : 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)

**2.1/. Contributing scenario controlling environmental exposure for: ERC4. ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems**

**Amount used**

Maximum daily site tonnage : 500 kg/day  
Fraction of EU tonnage used in region : 100%  
Fraction of Regional tonnage used locally : 0.046%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10  
Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 20  
Emission or Release Factor: Air : 1%  
Emission or Release Factor: Water : 0.01%  
Emission or Release Factor: Soil : 0.1%  
Remarks : ESVOC SpERC 7.13.v1

**Technical conditions and measures/**

**Organisational measures**

Exposure time : Continuous use/release  
Compartment : Fresh water, Fresh water sediment, Marine water, Marine sediment, Soil, Grassland, Sewage treatment plant

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

Type of Sewage Treatment Plant : Sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%

**2.2/. Contributing scenario controlling worker exposure for : PROC1: Use in closed process, no likelihood of exposure**

Activity : General exposures, (closed systems)

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#### Product characteristics

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 25%  
Physical Form (at time of use) : liquid

#### Frequency and duration of use

Exposure duration : > 240 min  
Remarks : Inhalation, Dermal  
Frequency of use : <= 240 days/ year

#### Human factors not influenced by risk management

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

#### Other operational conditions affecting workers exposure

Outdoor/ Indoor : Indoor  
Outdoor/ indoor : Outdoor

#### Exposure routes

Inhalation exposure, Dermal exposure

#### Organisational measures to prevent/ limit releases, dispersion and exposure

Assume a good basic standard of occupational hygiene is implemented

#### Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.) Effectiveness (of a measure): 95%

<b>2.3/. Contributing scenario controlling worker exposure for: PROC2: Used in closed, continuous process with occasional controlled exposure</b>
---

Activity : General exposures, Continuous process, (open systems)

#### Product characteristics

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 25%  
Physical Form (at time of use) : liquid

#### Frequency and duration of use

Exposure duration : > 240 min  
Frequency of use : <= 240 days/ year

#### Human factors not influenced by risk management

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

#### Other operational conditions affecting workers exposure

Outdoor/ Indoor : Indoor  
Outdoor/ Indoor : Outdoor

#### Exposure Routes

Inhalation exposure, dermal exposure

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**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%)

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC4	EUSES		Fresh water		0.0007 mg/L	0.041
			Fresh water sediment		0.318 mg/ kg dry weight	0.041
			Marine water		0.0001 mg/L	0.033
			Marine sediment		0.031 mg/ kg dry weight	0.041
			Sewage treatment plant		0.002 mg/ L	<0.01
			Soil		0.022 mg/ kg dry weight	<0.01

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#### Workers

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA v3.0		Long term inhalation	0.015 mg/m <sup>3</sup>	<0.01
			Long term dermal	0.002 mg/kg bw/day	<0.01
PROC2	ECETOC TRA v3.0		Long term inhalation	7.512 mg/m <sup>3</sup>	0.3
			Long term dermal	0.041 mg/kg bw/day	0.011
PROC3	ECETOC TRA v3.0		Long term inhalation	1.502 mg/m <sup>3</sup>	0.06
	ECETOC TRA v3.0		Long term dermal	0.021 mg/kg bw/day	<0.01

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

ERC7: Industrial use of substances in closed systems

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)

4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult the Internet site: Downstream Users  
[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)



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1/. Short title of Exposure Scenario: Industrial use, Processing aid/ Scavenging agent in refinery streams/ Corrosion inhibitors

Main User Groups : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental Release Categories : ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems

Process Categories : 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)

2.1/. Contributing scenario controlling environmental exposure for: ERC4. ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems

#### Amount used

Maximum daily site tonnage : 6000 kg/day  
Fraction of EU tonnage used in region : 100%  
Fraction of Regional tonnage used locally : 10%

#### Environmental factors not influenced by risk management

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10  
Dilution Factor (Coastal Areas) : 100

#### Other given operational conditions affecting environmental exposure

Number of emission days per year : 365  
Emission or Release Factor: Air : 0.25%  
Emission or Release Factor: Water : 0.001%  
Emission or Release Factor: Soil : 0.0%  
Remarks : spERC: ESVOC SpERC 7.12a.v1

#### Technical conditions and measures/

##### Organisational measures

Exposure time : Continuous use/release  
Compartment : Fresh water, Fresh water sediment, Marine water, Marine sediment, Soil, Grassland, Sewage treatment plant

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

Type of Sewage Treatment Plant : Sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%

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**2.2/. Contributing scenario controlling worker exposure for : PROC1: Use in closed process, no likelihood of exposure**

Activity : General exposures, (closed systems)

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 25%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Remarks : Inhalation, Dermal

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Outdoor/ indoor : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.) Effectiveness (of a measure): 90%

**2.3/. Contributing scenario controlling worker exposure for: PROC2: Used in closed, continuous process with occasional controlled exposure**

Activity : General exposures, Continuous process, (open systems)

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 25%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palms of both hands (480 cm<sup>2</sup>)

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**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor  
**Outdoor/ Indoor** : Outdoor

**Exposure Routes**

Inhalation exposure, dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.4/. Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**

**Activity** : Use in contained batch processes

**Product characteristics**

**Concentration of the substance in Mixture/ Article** : Covers the percentage of the substance in the product up to 25%  
**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 240 min  
**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor  
**Outdoor/ Indoor** : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 50%)  
Use in contained systems (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%)

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC4	EUSES		Fresh water		0.0001 mg/L	0.042
			Fresh water sediment		0.341 mg/ kg dry weight	0.044
			Marine water		0.0001 mg/L	0.035
			Marine sediment		0.034 mg/ kg dry weight	0.044
			Sewage treatment plant		0.003 mg/ L	<0.01
			Soil		0.027 mg/ kg dry weight	<0.01

**Workers**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA v3.0		Long term inhalation	0.015 mg/m <sup>3</sup>	<0.01
			Long term dermal	0.002 mg/kg bw/day	<0.01
PROC2	ECETOC TRA v3.0		Long term inhalation	7.512 mg/m <sup>3</sup>	0.3
			Long term dermal	0.041 mg/kg bw/day	0.011
PROC3	ECETOC TRA v3.0		Long term inhalation	1.502 mg/m <sup>3</sup>	0.06
	ECETOC TRA v3.0		Long term dermal	0.021 mg/kg bw/day	<0.01

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

ERC7: Industrial use of substances in closed systems

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)

**4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario**

For further information, please also consult the Internet site: Downstream Users

[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)

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1/. Short title of Exposure Scenario: Heat and pressure transfer fluids in dispersive, professional use but closed systems

Main User Groups : SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
Environmental Release Categories : ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems  
Process Categories : PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

2.1/. Contributing scenario controlling environmental exposure for: ERC9a. ERCb: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

**Amount used**

Maximum daily site tonnage : 12 kg/day  
Fraction of EU tonnage used in region : 10%  
Fraction of Regional tonnage used locally : 0.2%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 365  
Emission or Release Factor: Air : 5%  
Emission or Release Factor: Water : 5%  
Emission or Release Factor: Soil : 5%

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%

2.2/. Contributing scenario controlling worker exposure for : PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

Activity : (closed systems)

**Product characteristics**

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 5%  
Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min  
Remarks : Inhalation, Dermal  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

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**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor  
 Outdoor/ indoor : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable protective clothing

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC9a	EUSES		Fresh water		0.003 mg/L	0.208
			Fresh water sediment		1.595 mg/ kg dry weight	0.208
			Marine water		0.0003 mg/L	0.166
			Marine sediment		0.159 mg/ kg dry weight	0.207
			Sewage treatment plant		0.029 mg/ L	0.058
			Soil		0.256 mg/ kg dry weight	0.059

**Workers**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC20	ECETOC TRA v3.0		Long term inhalation	7.011 mg/m <sup>3</sup>	0.28
			Long term dermal	0.342 mg/kg bw/day	0.095

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed Systems

**4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario**

For further information, please also consult the Internet site: Downstream Users

[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)

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**1/. Short title of Exposure Scenario: Monomer use in epoxy, PU, adhesives, coatings and other polymers, Industrial**

**Main User Groups : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites**

**Environmental Release Categories : ERC6a, ERC6b, ERC6c, ERC6d: Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers**

**Process Categories : PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC7: Industrial spraying  
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
PROC10: Roller application or brushing  
PROC13: Treatment of articles by dipping or pouring  
PROC14: Production of preparations or articles by tableting, compression, extrusion, palletisation  
PROC19: Hand-mixing with intimate contact and only PPE available  
PROC24: High (mechanical) energy work-up of substances bound in materials and/ or articles**

**2.1/. Contributing scenario controlling environmental exposure for: ERC5: Industrial use resulting in inclusion into or onto a matrix**

**Amount used**

Maximum daily site tonnage : 800 kg/day  
Fraction of EU tonnage used in region : 100%  
Fraction of Regional tonnage used locally : 10%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 220  
Emission or Release Factor: Air : 1.7%  
Emission or Release Factor: Water : 0%  
Emission or Release Factor: Soil : 0%  
Remarks : SpERC: FEICA 5.1b.v1

**Technical conditions and measures/**

**Organisational measures**

Exposure time : Continuous use/release  
Compartment : Fresh water, Fresh water sediment. Marine water, Marine sediment, Soil, Grassland, Sewage treatment plant

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 100%

**2.2/. Contributing scenario controlling worker exposure for : PROC5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact)**

**Product characteristics**

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 5%  
Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 4 h  
Frequency of use : <= 240 days/ year  
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Human factors not influenced by risk management**

Dermal exposure : Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.3/. Contributing scenario controlling worker exposure for: PROC7: Industrial spraying**

Activity : Spraying, Spraying (automatic/ robotic)

**Product characteristics**

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 1%  
Physical Form (at time of use) : liquid



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**Frequency and duration of use**

Exposure duration : > 240 min  
Remarks : Inhalation, Dermal  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Both hands plus forearms (1500 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Exposure Routes**

Inhalation exposure, dermal exposure

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.4/. Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessel/large containers at non-dedicated facilities**

Activity : Drums/batch transfers, Bulk transfers  
Product characteristics  
Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 5%  
Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min  
Remarks : Inhalation, Dermal  
Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Both hands (960 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

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**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.5/. Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing**

Activity : Roller, spreader, flow application

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Duration of activity : >240 min

Remarks : Inhalation, Dermal

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Both hands (960 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 90%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%

**2.6/. Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring**

Activity : dipping, immersion and pouring

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 240 min

Remarks : Inhalation, Dermal

Frequency of use : <= 240 days/ year

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**Human factors not influenced by risk management**

**Dermal exposure** : Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Technical conditions and measures**

**Provide extraction ventilation at points where emissions occur (Effectiveness (of a measure): 90%)**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

**Assume a good basic standard of occupational hygiene is implemented**

**Conditions and measures related to personal protection, hygiene and health evaluation**

**Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.) Effectiveness (of a measure): 95%**

**2.7/. Contributing scenario controlling worker exposure for: PROC14: Production of preparations of articles by tableting, compression, extrusion, pelletisation**

**Activity** : Production of preparations of articles by tableting, compression, extrusion, palletisation

**Product characteristics**

**Concentration of the substance in Mixture/**

**Article** : Covers the percentage of the substance in the product up to 5%

**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 4 h

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

**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Exposure routes**

**Inhalation exposure, Dermal exposure**

**Technical conditions and measures**

**Provide extraction ventilation at points where emissions occur (Effectiveness (of a measure): 90%)**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

**Assume a good basic standard of occupational hygiene is implemented**

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**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%

**2.8/. Contributing scenario controlling worker exposure for: PROC19: Hand mixing with intimate contact and only PPE available**

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Duration of the activity : 15 min – 1 h

Frequency of use : <= 240 days/ year

**Human factors not influenced by risk management**

Dermal exposure : Both hands and main part of arm (1980 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374) in combination with specific activity training. (Effectiveness (of a measure): 95%)

Wear a respirator conforming to EN140 with type A filter or better. (Effectiveness (of a measure): 90%)

**2.9/. Contributing scenario controlling worker exposure for: PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles**

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 1%

Physical Form (at time of use) : Solid mixture, Dustiness: Medium

**Frequency and duration of use**

Duration of the activity : >4 h

Frequency of use : <= 240 days/ year

Remarks : Covers daily exposure up to 8 hours (unless stated differently)

**Human factors not influenced by risk management**

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

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**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor  
Outdoor/ Indoor : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC5	EUSES		Fresh water		0.0004 mg/L	0.027
			Fresh water sediment		0.204 mg/ kg dry weight	0.027
			Marine water		0.0001 mg/L	0.021
			Marine sediment		0.02 mg/ kg dry weight	0.026
			Sewage treatment plant		0 mg/ L	<0.01
			Soil		0.002 mg/ kg dry weight	<0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC5	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.137 mg/kg bw/day	0.038
PROC7	ECETOC TRA v3.0		Long term inhalation	3.13 mg/m <sup>3</sup>	0.125
			Long term dermal	0.214 mg/kg bw/day	0.06
PROC8a	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.137 mg/kg bw/day	0.038
PROC10	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.274 mg/kg bw/day	0.076
PROC10	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.274 mg/kg bw/day	0.076
PROC13	ECETOC TRA v3.0		Long term inhalation	2.504 mg/m <sup>3</sup>	0.1
			Long term dermal	0.137 mg/kg bw/day	0.038
PROC19	ECETOC TRA v3.0		Long term inhalation	0.501 mg/m <sup>3</sup>	0.02
			Long term dermal	0.283 mg/kg bw/day	0.079
PROC24	ECETOC TRA v3.0	Indoor	Long term inhalation	1 mg/m <sup>3</sup>	0.04
		Outdoor	Long term inhalation	0.75 mg/m <sup>3</sup>	0.03
			Long term dermal	0.288 mg/kg bw/day	0.08

ERC5: Industrial use resulting in inclusion into or onto a matrix  
 PROC10: Roller application or brushing  
 PROC13: Treatment of articles by dipping or pouring  
 PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation  
 PROC19: Hand mixing with intimate contact and only PPE available  
 PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles  
 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
 PROC7: Industrial spraying  
 PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

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4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult the Internet site: Downstream Users  
[http://guidance.echa.europa.eu/downstream\\_users\\_en.htm](http://guidance.echa.europa.eu/downstream_users_en.htm)

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1/. Short title of Exposure Scenario: Monomer use in epoxy, PU, adhesives, coatings and other polymers, Professional

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

Environmental Release Categories : ERC8c, ERC8f: wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Process Categories : PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
PROC10: Roller application or brushing  
PROC11: Non industrial spraying  
PROC13: Treatment of articles by dipping or pouring  
PROC14: Production of preparations or articles by tableting, compression, extrusion, palletisation  
PROC19: Hand-mixing with intimate contact and only PPE available

2.1/. Contributing scenario controlling environmental exposure for: ERC8c, ERC8f: Wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**Amount used**

Maximum daily site tonnage : 2 kg/day  
Fraction of EU tonnage used in region : 10%  
Fraction of Regional tonnage used locally : 0.2%

**Environmental factors not influenced by risk management**

Flow rate : 18000 m<sup>3</sup>/ day  
Dilution Factor (River) : 10

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 365  
Emission or Release Factor: Air : 0%  
Emission or Release Factor: Water : 1.5%  
Emission or Release Factor: Soil : 0%  
Remarks : SpERC: FEICA 8c.1a.v1

**Technical conditions and measures/**

**Organisational measures**

Exposure time : Continuous use/release  
Compartment : Fresh water, Fresh water sediment. Marine water, Marine sediment, Soil, Grassland, Sewage treatment plant

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Flow rate of sewage treatment plant effluent: 2,000 m<sup>3</sup>/ day  
Percentage removed from waste water : 90.4%



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2.2/. Contributing scenario controlling worker exposure for : PROC5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact)

Activity : Indoor

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Exposure duration : > 4 h

Frequency of use : <= 240 days/ year

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

**Human factors not influenced by risk management**

Dermal exposure : Palm of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Ventilation rate per hour : 3

Remarks : Use in large workrooms only

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%

2.3/. Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch process for formulation of preparations and articles (multistage and/or significant contact)

Activity : Outdoor

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Duration of activity : > 4 h

Remarks : Covers daily exposures up to 8 hours (unless Stated differently)

Frequency of use : <= 240 days/ year

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**Human factors not influenced by risk management**

**Dermal exposure** : Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Outdoor

**Exposure Routes**

**Inhalation exposure, dermal exposure**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%

**2.4/. Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessel/large containers at non-dedicated facilities**

**Activity** : Indoor

**Product characteristics**

**Concentration of the substance in Mixture/ Article** : Covers the percentage of the substance in the product up to 5%

**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Exposure duration** : > 4 h

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

**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Both hands (960 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Ventilation rate per hour** : 3

**Remarks** : Use in large workrooms only

**Mass transfer rate** : 10-100 L/min

**Exposure routes**

**Inhalation exposure, Dermal exposure**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%

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**2.5/. Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/ discharging) from/to vessel/large containers at non-dedicated facilities**

Activity : Outdoor

Product characteristics

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use) : liquid

Frequency and duration of use

Exposure duration : > 4 h

Remarks : Covers daily exposures up to 8 hours (unless Stated differently)

Frequency of use : <= 240 days/ year

Human factors not influenced by risk management

Dermal exposure : Both hands (960 cm<sup>2</sup>)

Other operational conditions affecting workers exposure

Outdoor/ Indoor : outdoor

Exposure routes

Inhalation exposure, Dermal exposure

Organisational measures to prevent/ limit releases, dispersion and exposure

Assume a good basic standard of occupational hygiene is implemented

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%

**2.6/. Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing**

Activity : Roller, spreader, flow application

Product characteristics

Concentration of the substance in Mixture/  
Article : Covers the percentage of the substance in the product up to 1%

Physical Form (at time of use) : liquid

Frequency and duration of use

Duration of activity : >240 min

Remarks : Inhalation, Dermal

Frequency of use : <= 240 days/ year

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

Human factors not influenced by risk management

Dermal exposure : Both hands (960 cm<sup>2</sup>)

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**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor  
Ventilation rate per hour : 3  
Remarks : Use in large workrooms only  
Outdoor/ Indoor : Outdoor  
Spreading of liquids on surfaces or work pieces : > 3 m<sup>2</sup>/hour

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 80%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374) in combination with specific activity training. (Effectiveness (of a measure): 80%)

In case no LEV is present, a suitable respiratory protection with adequate effectiveness is required. Wear a respirator conforming to EN140 with Type A filter or better. (Effectiveness (of a measure): 90%)

**2.7/. Contributing scenario controlling worker exposure for: PROC11: Non industrial spraying**

Activity : Spraying, Manual

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 1%

Physical Form (at time of use) : liquid

**Frequency and duration of use**

Duration of activity : >240 min

Remarks : Inhalation, Dermal

Frequency of use : <= 240 days/ year

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

**Human factors not influenced by risk management**

Dermal exposure : Both hands plus forearms (1500 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Outdoor/ Indoor : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

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**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374) in combination with specific activity training. (Effectiveness (of a measure): 80%)

Wear a respirator conforming to EN140 with Type A filter or better. (Effectiveness (of a measure): 90%)

**2.8/. Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring**

Activity : Dipping, immersion and pouring

**Product characteristics**

Concentration of the substance in Mixture/  
Article

: Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use)

: liquid

**Frequency and duration of use**

Duration of activity

: >240 min

Remarks

: Inhalation, Dermal

Frequency of use

: <= 240 days/ year

Remarks

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

**Human factors not influenced by risk management**

Dermal exposure

: Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor

: Indoor

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur. (Effectiveness (of a measure): 80%)

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves (tested to EN374). (Effectiveness (of a measure): 80%)

**2.9/. Contributing scenario controlling worker exposure for: PROC14: Production of preparations of articles by tableting, compression, extrusion, pelletisation**

**Product characteristics**

Concentration of the substance in Mixture/  
Article

: Covers the percentage of the substance in the product up to 5%

Physical Form (at time of use)

: liquid

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**Frequency and duration of use**

**Exposure duration** : > 4 h  
**Remarks** : Covers daily exposures up to 8 hours (unless stated differently)  
**Frequency of use** : <= 240 days/ year

**Human factors not influenced by risk management**

**Dermal exposure** : Palms of both hands (480 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Exposure routes**

**Inhalation exposure, Dermal exposure**

**Technical conditions and measures**

**Provide extraction ventilation at points where emissions occur (Effectiveness (of a measure): 90%)**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

**Assume a good basic standard of occupational hygiene is implemented**

**Conditions and measures related to personal protection, hygiene and health evaluation**

**Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
Wear suitable gloves (tested to EN374). Effectiveness (of a measure): 80%**

<b>2.10/. Contributing scenario controlling worker exposure for: PROC19: Hand mixing with intimate contact and only PPE available</b>
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**Product characteristics**

**Concentration of the substance in Mixture/**

**Article** : Covers the percentage of the substance in the product up to 5%

**Physical Form (at time of use)** : liquid

**Frequency and duration of use**

**Duration of the activity** : < 1 h  
**Frequency of use** : <= 240 days/ year  
**Exposure duration** : < 1 h

**Human factors not influenced by risk management**

**Dermal exposure** : Both hands and main part of arms (1980 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

**Outdoor/ Indoor** : Indoor

**Exposure routes**

**Inhalation exposure, Dermal exposure**

**Organisational measures to prevent/ limit releases, dispersion and exposure**

**Assume a good basic standard of occupational hygiene is implemented**

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**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.  
 Wear suitable gloves (tested to EN374). (Effectiveness (of a measure): 80%)  
 Wear a respirator conforming to EN140 with Type A filter or better. (Effectiveness (of a measure): 90%)

**2.11/. Contributing scenario controlling worker exposure for: PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles**

**Product characteristics**

Concentration of the substance in Mixture/

Article : Covers the percentage of the substance in the product up to 1%

Physical Form (at time of use) : Solid, medium dustiness

**Frequency and duration of use**

Duration of the activity : >4 h

Frequency of use : <= 240 days/ year

Remarks : Covers daily exposure up to 8 hours (unless stated differently)

**Human factors not influenced by risk management**

Dermal exposure : Palm of one hand (240 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

Outdoor/ Indoor : Indoor

Outdoor/ Indoor : Outdoor

**Exposure routes**

Inhalation exposure, Dermal exposure

**Organisational measures to prevent/ limit releases, dispersion and exposure**

Assume a good basic standard of occupational hygiene is implemented

**3/. Exposure estimation and reference to its source**

**Environment**

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Compartment	Value	Level of Exposure	RCR
ERC8c	EUSES		Fresh water		0.0006 mg/L	0.035
			Fresh water sediment		0.272 mg/ kg dry weight	0.035
			Marine water		0.0001 mg/L	0.028
			Marine sediment		0.026 mg/ kg dry weight	0.034
			Sewage treatment plant		0.002 mg/ L	<0.01
			Soil		0.014 mg/ kg dry weight	<0.01

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Workers

Contributing Scenario	Exposure Assessment Method	Specific Conditions	Value	Level of Exposure	RCR
PROC5	ART	Indoor	Long term inhalation	1.9 mg/m <sup>3</sup>	0.076
	ECETOC TRA v3.0		Long term dermal	0.548 mg/kg bw/day	0.152
PROC5	ART	Outdoor	Long term inhalation	0.69 mg/m <sup>3</sup>	0.028
	ECETOC TRA v3.0		Long term dermal	0.548 mg/kg bw/day	0.152
PROC8a	ART	Indoor	Long term inhalation	5.8 mg/m <sup>3</sup>	0.232
	ECETOC TRA v3.0		Long term dermal	0.548 mg/kg bw/day	0.152
PROC8a	ART	Outdoor	Long term inhalation	2.1 mg/m <sup>3</sup>	0.084
	ECETOC TRA v3.0		Long term dermal	0.548 mg/kg bw/day	0.152
PROC10	ART	Indoor	Long term inhalation	0.58 mg/m <sup>3</sup>	0.023
	ART	Outdoor	Long term inhalation	1.764 mg/m <sup>3</sup>	0.071
	ECETOC TRA v3.0		Long term dermal	0.549 mg/kg bw/day	0.152
PROC11	ART	Indoor	Long term inhalation	3.8 mg/m <sup>3</sup>	0.152
	ART	Outdoor	Long term inhalation	1.4 mg/m <sup>3</sup>	0.056
	ECETOC TRA v3.0		Long term dermal	2.143 mg/kg bw/day	0.595
PROC13	ECETOC TRA v3.0		Long term inhalation	10.02 mg/m <sup>3</sup>	0.401
			Long term dermal	0.548 mg/kg bw/day	0.152
PROC14	ECETOC TRA v3.0		Long term inhalation	10.02 mg/m <sup>3</sup>	0.401
			Long term dermal	0.137 mg/kg bw/day	0.038
PROC19	ECETOC TRA v3.0		Long term inhalation	1.002 mg/m <sup>3</sup>	0.04
			Long term dermal	0.1.131 mg/kg bw/day	0.314
PROC24	ECETOC TRA v3.0	Indoor	Long term inhalation	2 mg/m <sup>3</sup>	0.08
		Outdoor	Long term inhalation	1.5 mg/m <sup>3</sup>	0.06
			Long term dermal	0.288 mg/kg bw/day	0.08



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ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix  
ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix  
PROC10: Roller application or brushing  
PROC11: Non industrial spraying  
PROC13: Treatment of articles by dipping or pouring  
PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation  
PROC19: Hand mixing with intimate contact and only PPE available  
PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles  
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

<p>4/. Guidance to Downstream Users to evaluate whether he works inside the boundaries set by the Exposure Scenario</p>
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