

# SAFETY DATA SHEET



Ethylenediamine, EDA

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

### 1.1 Product identifier

**Product name** : Ethylenediamine, EDA

**Index number** : 612-006-00-6

**EC number** : 203-468-6

#### REACH Registration number

Registration number	Legal entity
01-2119480383-37-0001	Delamine BV

**CAS number** : 107-15-3

**Product description** : Not applicable

**Product type** : Liquid.

**Other means of identification** : 1,2-Diaminoethane; 1,2-Ethanediamine; Ethylenediamine, >25% in a non hazardous diluent; ETHYLENE DIAMINE; 1,2-Diaminoethane, hydrate

**Chemical formula** : C2-H8-N2

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

**Product use** : Intermediate. Chemical synthesis.

**Area of application** : Industrial applications.

#### Identified uses

Formulation - Industrial  
Manufacture of substance - Industrial  
Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
Use as a process additive - Industrial  
Use as a process additive - Professional  
Use as an intermediate - Industrial

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

DELAMINE B.V.  
Barchman Wuytierslaan 10  
3818 LH Amersfoort  
Netherlands  
Telephone number: +31-334676897

**e-mail address of person responsible for this SDS** : SDS.Delamine@delamine.com

### 1.4 Emergency telephone number

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

### Supplier

Telephone number : GBK/Infotrac ID 104075 : International (001) 352 323 3500 (24 hours per day)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Product definition : Mono-constituent substance

#### Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Flam. Liq. 3, H226  
Acute Tox. 4, H302  
Acute Tox. 3, H311  
Acute Tox. 4, H332  
Skin Corr. 1B, H314  
Eye Dam. 1, H318  
Resp. Sens. 1, H334  
Skin Sens. 1, H317  
Aquatic Chronic 3, H412

#### Classification according to Directive 67/548/EEC [DSD]

R10  
Xn; R20/21/22  
C; R34  
R42/43

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

### 2.2 Label elements

#### Hazard pictograms



#### Signal word

: Danger

#### Hazard statements

: **F**lammable liquid and vapour.  
Toxic in contact with skin.  
Harmful if swallowed or if inhaled.  
Causes severe skin burns and eye damage.  
May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
May cause an allergic skin reaction.  
Harmful to aquatic life with long lasting effects.

#### Precautionary statements

##### Prevention

: **P**Wear protective gloves: > 8 hours (breakthrough time): neoprene. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Avoid release to the environment. Do not breathe dust/fume/gas/mist/vapours/spray.

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## SECTION 2: Hazards identification

- Response** :  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical attention.
- Storage** :  Store locked up.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Hazardous ingredients** :  Ethylenediamine
- Supplemental label elements** : Not applicable.
- Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : Not applicable.
- Special packaging requirements**
- Containers to be fitted with child-resistant fastenings** : Not applicable.
- Tactile warning of danger** : Not applicable.

### 2.3 Other hazards

**Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII** : No.

**Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII** : No.

**Other hazards which do not result in classification** :  Not applicable.

## SECTION 3: Composition/information on ingredients

**Substance/mixture** : Mono-constituent substance

Product/ingredient name	Identifiers	%	Classification		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	

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### SECTION 3: Composition/information on ingredients

Ethylenediamine	EC: 203-468-6 CAS: 107-15-3 Index: 612-006-00-6	100	R10 Xn; R20/21/22 C; R34 R42/43  <b>See Section 16 for the full text of the R-phrases declared above.</b>	Flam. Liq. 3, H226 Acute Tox. 4, H302 Acute Tox. 3, H311 Acute Tox. 4, H332 Skin Corr. 1B, H314 Eye Dam. 1, H318 Resp. Sens. 1, H334 Skin Sens. 1, H317 Aquatic Chronic 3, H412  <b>See Section 16 for the full text of the H statements declared above.</b>	[A]
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There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

Occupational exposure limits, if available, are listed in Section 8.

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

## SECTION 4: First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

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

#### Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- Skin contact** : Causes severe burns. Toxic in contact with skin. May cause an allergic skin reaction.
- Ingestion** : Harmful if swallowed. Corrosive to the digestive tract. Causes burns.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
wheezing and breathing difficulties  
asthma
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur
- Ingestion** : Adverse symptoms may include the following:  
stomach pains

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

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

**Suitable extinguishing media** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam. Dry sand or other suitable absorbent.

**Unsuitable extinguishing media** : Do not use water jet. Halones

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

**Hazards from the substance or mixture** : **F**lammable liquid and vapour. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides

### 5.3 Advice for firefighters

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

## SECTION 6: Accidental release measures

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

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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## SECTION 6: Accidental release measures

**6.2 Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

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

**Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.

**6.4 Reference to other sections** : See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 7.1 Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

### 7.2 Conditions for safe storage, including any incompatibilities

Date of issue/Date of revision

: 25/06/2015

Date of previous issue

: 08/04/2014

Version : 9

7/69



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## SECTION 7: Handling and storage

Store between the following temperatures: 11 to 50°C (51.8 to 122°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from acids. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

### Seveso Directive - Reporting thresholds (in tonnes)

#### Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P5c: Flammable liquids 2 and 3 not falling under P5a or P5b	5000	50000
C6: Flammable (R10)	5000	50000

### 7.3 Specific end use(s)

**Recommendations** : No specific data.

**Industrial sector specific solutions** : No specific data.

## SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 8.1 Control parameters

#### Occupational exposure limits

Product/ingredient name	Exposure limit values
Ethylenediamine	<b>ACGIH TLV (United States, 4/2014). Absorbed through skin.</b> TWA: 10 ppm 8 hours.
Ethylenediamine	<b>ACGIH TLV (United States, 4/2014). Absorbed through skin.</b> TWA: 10 ppm 8 hours.

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

#### DNELs/DMELs



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## SECTION 8: Exposure controls/personal protection

Product/ingredient name	Type	Exposure	Value	Population	Effects
Ethylenediamine	DNEL	Short term Dermal	5 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	35 mg/m <sup>3</sup>	Workers	Systemic
	DNEL	Long term Dermal	3.6 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	25 mg/m <sup>3</sup>	Workers	Systemic
	DNEL	Long term Oral	0.27 mg/kg bw/day	Consumers	Systemic

### PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
Ethylenediamine	Secondary Poisoning	4.9 mg/kg	Assessment Factors
	Fresh water	0.016 mg/l	Assessment Factors
	Marine	0.002 mg/l	Assessment Factors
	Fresh water sediment	1.67 mg/kg dwt	-
	Marine water sediment	0.167 mg/kg dwt	-
	Soil	1.992 mg/kg dwt	-
Sewage Treatment Plant	0.5 mg/l	Assessment Factors	

## 8.2 Exposure controls

### Appropriate engineering controls

: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

### Individual protection measures

#### Hygiene measures

: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Eye/face protection

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

#### Skin protection

## SECTION 8: Exposure controls/personal protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): neoprene
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: neoprene Boots.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: ammonia filter (Type K) ammonia (Type K) and particulate filter
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

- Physical state** : Liquid. [Viscous liquid.]
- Colour** : Colourless.
- Odour** : Mild. Ammoniacal.
- Odour threshold** : Not available.
- pH** : 12 [Conc. (% w/w): 1%]
- Melting point/freezing point** : 10.8 to 11°C
- Initial boiling point and boiling range** : 117°C
- Flash point** : Closed cup: 38 to 42°C
- Evaporation rate** : 0.91 (butyl acetate = 1)
- Flammability (solid, gas)** : Not applicable.
- Burning time** : Not applicable.
- Burning rate** : Not applicable.

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## SECTION 9: Physical and chemical properties

<b>Upper/lower flammability or explosive limits</b>	: Lower: 2.7% Upper: 16.6%
<b>Vapour pressure</b>	: 1.3 kPa [room temperature]
<b>Vapour density</b>	: 2.07 [Air = 1]
<b>Relative density</b>	: <input checked="" type="checkbox"/> Not available.
<b>Solubility(ies)</b>	: <input checked="" type="checkbox"/> Not available.
<b>Solubility in water</b>	: 1000 g/l
<b>Partition coefficient: n-octanol/ water</b>	: -2 to -1.3
<b>Auto-ignition temperature</b>	: 385 to 405°C
<b>Decomposition temperature</b>	: Not available.
<b>Viscosity</b>	: Dynamic (room temperature): 1.265 mPa·s
<b>Explosive properties</b>	: Not applicable.
<b>Oxidising properties</b>	: None.

### 9.2 Other information

<b>Density</b>	: <input checked="" type="checkbox"/> 0.897 g/cm <sup>3</sup> [20°C]
<b>Physical/chemical properties comments</b>	: No additional information.

## SECTION 10: Stability and reactivity

<b>10.1 Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: Under normal conditions of storage and use, hazardous reactions will not occur.  Under normal conditions of storage and use, hazardous polymerisation will not occur.
<b>10.4 Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapour to accumulate in low or confined areas.aerosol or mist formation
<b>10.5 Incompatible materials</b>	: <input checked="" type="checkbox"/> Reactive or incompatible with the following materials: oxidizing materials, metals and acids. Chlorinated hydrocarbon.
<b>10.6 Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

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## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ethylenediamine	LC50 Inhalation Vapour	Rat	14700 mg/m <sup>3</sup>	4 hours
	LD50 Dermal	Rat	560 mg/kg	-
	LD50 Oral	Rat	866 mg/kg	-

**Conclusion/Summary** : No additional information.

#### Irritation/Corrosion

##### **Conclusion/Summary**

**Skin** : Corrosive to the skin.

**Eyes** : Corrosive to eyes.

**Respiratory** : No additional information.

#### Sensitisation

Product/ingredient name	Route of exposure	Species	Result
Ethylenediamine	skin	Guinea pig	Sensitising

##### **Conclusion/Summary**

**Skin** : May cause skin sensitisation.

**Respiratory** : May cause sensitisation by inhalation.

#### Mutagenicity

Product/ingredient name	Test	Experiment	Result
Ethylenediamine	-	Experiment: In vivo Subject: Mammalian-Animal Cell: Germ	Negative

**Conclusion/Summary** : No mutagenic effect.

#### Carcinogenicity

**Conclusion/Summary** : Oral : Cannot be classified. NOAEL= 159 mg/kg bw/day  
Dermal: Cannot be classified. NOAEL= 8 mg/kg bw/day

#### Reproductive toxicity

**Conclusion/Summary** : Fertility Cannot be classified. NOAEL Oral= 500 mg/kg bw/day  
Developmental Toxicity: Cannot be classified. NOAEL Oral= 250 mg/kg bw/day

#### Teratogenicity

**Conclusion/Summary** : Cannot be classified.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

#### Aspiration hazard

Not available.

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## SECTION 11: Toxicological information

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** :  Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- Skin contact** : Causes severe burns. Toxic in contact with skin. May cause an allergic skin reaction.
- Ingestion** :  Harmful if swallowed. Corrosive to the digestive tract. Causes burns.

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

- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
wheezing and breathing difficulties  
asthma
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur
- Ingestion** : Adverse symptoms may include the following:  
stomach pains

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : No specific data.
- Potential delayed effects** : No specific data.

#### Long term exposure

- Potential immediate effects** : No specific data.
- Potential delayed effects** : No specific data.

### Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
<input checked="" type="checkbox"/> Ethylenediamine	Sub-chronic NOAEL Oral Sub-acute NOAEL Inhalation Vapour	Rat Rat - Male, Female	22 mg/kg 144 mg/m <sup>3</sup>	- 6 weeks

- Conclusion/Summary** : Cannot be classified.
- General** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

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## SECTION 11: Toxicological information

<b>Carcinogenicity</b>	: No known significant effects or critical hazards.
<b>Mutagenicity</b>	: No known significant effects or critical hazards.
<b>Teratogenicity</b>	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
<b>Fertility effects</b>	: No known significant effects or critical hazards.
<b>Elimination</b>	: Rapidly excreted. Excreted via the urine.

**Other information** : No specific data.

## SECTION 12: Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Ethylenediamine	EC50 3.2 mg/l	Micro-organism	2 hours
	NOEC 0.5 mg/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

**Conclusion/Summary** : PNEC Intermittent release.= 0.167 mg/l

### 12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Ethylenediamine	-	95 % - 28 days	-	-
	-	88 % - 15 days	-	-
	-	10 % - 5 days	-	-

**Conclusion/Summary** : This substance is not expected to bioaccumulate through food chains in the environment. Readily biodegradable. not persistent. Not toxic.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Ethylenediamine	-	-	Readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Ethylenediamine	-2 to -1.3	<2000	high

### 12.4 Mobility in soil

<b>Soil/water partition coefficient (K<sub>oc</sub>)</b>	: 4766
<b>Mobility</b>	: No specific data.

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## SECTION 12: Ecological information

### 12.5 Results of PBT and vPvB assessment

**PBT** : No.

**vPvB** : No.

**12.6 Other adverse effects** : No known significant effects or critical hazards.

## SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 13.1 Waste treatment methods

#### Product

**Methods of disposal** :  The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.





**Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

#### Packaging

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Special precautions** : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

## SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
<b>14.1 UN number</b>	UN1604	UN1604	UN1604	UN1604
<b>14.2 UN proper shipping name</b>	ETHYLENEDIAMINE	ETHYLENEDIAMINE	ETHYLENEDIAMINE	Ethylenediamine
<b>14.3 Transport hazard class(es)</b>	8 (3) 	8 (3) 	8 (3) 	8 (3) 



Ethylenediamine, EDA

## SECTION 14: Transport information

<b>14.4 Packing group</b>	II	II	II	II
<b>14.5 Environmental hazards</b>	No.	Yes.	No.	No.
<b>Additional information</b>	<p><b><u>Hazard identification number</u></b> 83</p> <p><b><u>Limited quantity</u></b> 1 L</p> <p><b><u>Tunnel code</u></b> (D/E)</p>	<p>The product is only regulated as an environmentally hazardous substance when transported in tank vessels.</p>	<p><b><u>Emergency schedules (EmS)</u></b> F-E, S-C</p>	<p><b><u>Passenger and Cargo Aircraft</u></b> Quantity limitation: 1 L Packaging instructions: 851</p> <p><b><u>Cargo Aircraft Only</u></b> Quantity limitation: 30 L Packaging instructions: 855</p> <p><b><u>Limited Quantities - Passenger Aircraft</u></b> Quantity limitation: 0.5 L Packaging instructions: Y840</p>

**14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

## SECTION 15: Regulatory information

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

**EU Regulation (EC) No. 1907/2006 (REACH)**

**Annex XIV - List of substances subject to authorisation**

**Substances of very high concern**

None of the components are listed.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : Not applicable.

**Other EU regulations**

**Europe inventory** : All components are listed or exempted.

**Seveso Directive**

Ethylenediamine, EDA

## SECTION 15: Regulatory information

This product is controlled under the Seveso Directive.

### Danger criteria

#### Category

P5c: Flammable liquids 2 and 3 not falling under P5a or P5b  
C6: Flammable (R10)

**15.2 Chemical Safety Assessment** : Complete.

**15.3 Registration status** : Applicable.

## SECTION 16: Other information

Indicates information that has changed from previously issued version.

**Abbreviations and acronyms** : ATE = Acute Toxicity Estimate  
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]  
DMEL = Derived Minimal Effect Level  
DNEL = Derived No Effect Level  
EUH statement = CLP-specific Hazard statement  
PBT = Persistent, Bioaccumulative and Toxic  
PNEC = Predicted No Effect Concentration  
RRN = REACH Registration Number  
vPvB = Very Persistent and Very Bioaccumulative

**Key literature references and sources for data** : Regulation (EC) No. 1272/2008 [CLP]; European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), concluded in Geneva on 30 September 1957 plus amendments (Uniform text: Journal of Laws 27/2009 pos. 162 plus amendments); Regulation for the transport of dangerous materials on the Rhine (ADN); Occupational exposure limits; International regulations

### Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Flam. Liq. 3, H226 Acute Tox. 4, H302 Acute Tox. 3, H311 Acute Tox. 4, H332 Skin Corr. 1B, H314 Eye Dam. 1, H318 Resp. Sens. 1, H334 Skin Sens. 1, H317 Aquatic Chronic 3, H412	Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment

**Full text of abbreviated H statements** : H226 Flammable liquid and vapour.  
H302 Harmful if swallowed.  
(oral)  
H311 Toxic in contact with skin.  
(dermal)  
H314 Causes severe skin burns and eye damage.  
H317 May cause an allergic skin reaction.

Ethylenediamine, EDA

## SECTION 16: Other information

	H318	Causes serious eye damage.
	H332	Harmful if inhaled. (inhalation)
	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
	H412	Harmful to aquatic life with long lasting effects.
<b>Full text of classifications [CLP/GHS]</b>	: Acute Tox. 3, H311	ACUTE TOXICITY (dermal) - Category 3
	Acute Tox. 4, H302	ACUTE TOXICITY (oral) - Category 4
	Acute Tox. 4, H332	ACUTE TOXICITY (inhalation) - Category 4
	Aquatic Chronic 3, H412	LONG-TERM AQUATIC HAZARD - Category 3
	Eye Dam. 1, H318	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
	Flam. Liq. 3, H226	FLAMMABLE LIQUIDS - Category 3
	Resp. Sens. 1, H334	RESPIRATORY SENSITIZATION - Category 1
	Skin Corr. 1B, H314	SKIN CORROSION/IRRITATION - Category 1B
	Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1
<b>Full text of abbreviated R phrases</b>	: R10-	Flammable.
	R20/21/22-	Harmful by inhalation, in contact with skin and if swallowed.
	R34-	Causes burns.
	R42/43-	May cause sensitisation by inhalation and skin contact.
<b>Full text of classifications [DSD/DPD]</b>	: C -	Corrosive
	Xn -	Harmful
<b>Training advice</b>	: Ensure	operatives are trained to minimise exposures. Training staff on good practice.
<b>Date of issue/ Date of revision</b>	: 25/06/2015	
<b>Date of previous issue</b>	: 08/04/2014	
<b>Version</b>	: 9	

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Formulation of preparations

<b>Amounts used:</b>	14044Tonnes/year
<b>Fraction of EU tonnage used in region</b>	100%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	10%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	220
<b>Environment factors not influenced by risk management:</b>	River flow rate: 18000 m³/d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	SpERC 2.2.v1
<b>Release fraction to air from process (initial release prior to RMM)</b>	0.025%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0.01%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	0.5%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 85%
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.

Ethylenediamine, EDA

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.

<b>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of</b>	Not available.
<b>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of</b>	Not available.
<b>Conditions and measures related to municipal sewage treatment plant:</b>	Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.
<b>Maximum release for RCR &lt;1 :</b>	3.4 kg/day
<b>Scaling factors:</b>	If dilution factor* is increased to ... no additional RMM necessary for RCR < 1: >89.5

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 0: Use in closed batch process (synthesis or formulation)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90%efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 1: Use in batch and other process (synthesis) where opportunity for exposure arises

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation : 90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

**Ethylenediamine, EDA**

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Method Detail:</b>	
<b>Activity class:</b>	Open liquid surfaces, agitated surfaces
<b>Surface area- Open (m<sup>2</sup>):</b>	0.3-1
<b>Primary controls:</b>	Level of containment / Medium ,90%
<b>Secondary controls:</b>	Handle the material in a fume hood/cupboard or under local exhaust ventilation. ; efficiency :50%
<b>Location:</b>	Indoor
<b>Room size:</b>	Any
<b>Ventilation rate:</b>	Provide enhanced general ventilation by mechanical means. :1 ACH
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces : Palm of both hands (480 cm <sup>2</sup> )
<b>Other given operational conditions affecting workers exposure:</b>	Indoor use Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :50% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day:< 15 min. , Frequency :240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Both hands (960 cm <sup>2</sup> )
<b>Other given operational conditions affecting workers exposure:</b>	Outdoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

Ethylenediamine, EDA

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day:>1hours , Frequency :240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :97% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 5: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 5%.
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 6: Use a laboratory reagent

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency

**Ethylenediamine, EDA**

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.



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

Not relevant in ECETOC TRA

**Personal protection:**

Chemical-resistant gloves.:  
98% , eye protection (e.g. protective goggles).Protective clothing

**Respiratory protection:**

None.

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

##### Contributing scenario controlling environmental exposure for 0: Formulation of preparations

	<b>Release from point source (local exposure estimation) kg/day</b>	<b>Total release for regional exposure estimation kg/day</b>	<b>Justification</b>
<b>Waste water</b>	Not applicable.	Not applicable.	Not applicable.
<b>Surface water</b>	Not applicable.	Not applicable.	Not applicable.
<b>air (direct + STP)</b>	Not applicable.	Not applicable.	Not applicable.
<b>Soil (direct releases only)</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
<b>Concentration in sewage (PECstp) mg/l</b>	0.15	Not applicable.	
<b>Concentration in sewage sludge mg/kg dwt</b>	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Fresh water mg/l</b>	Not applicable.	0.0156	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	0.00156	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	1.63	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	0.163	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	0.11	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.17	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

#### Section 3.2 Workers - Exposure estimation

##### Contributing scenario controlling worker exposure for 0: Use in closed batch process (synthesis or formulation)

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Not applicable.	0.000686	Not applicable.
<b>Long term exposure, Systemic, Inhalable</b>	Not applicable.	6.265	Not applicable.
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC02

**Market sector by type of chemical product:** Not applicable.

Long term exposure, Local, Inhalable	Not applicable.	6.265	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation**

**Contributing scenario controlling worker exposure for 1: Use in batch and other process (synthesis) where opportunity for exposure arises**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.013714	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	5.012	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	5.012	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation**

**Contributing scenario controlling worker exposure for 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001371	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.6	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.6	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC02

**Market sector by type of chemical product:** Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.274286	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	8.77	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	8.77	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.013714	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.255	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.255	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 5: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.013714	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC02

**Market sector by type of chemical product:** Not applicable.

Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 6: Use a laboratory reagent

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.000686	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

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

Environment	Not available.
Health	Not available.

### Section 5. Remarks: Additional good practice advice beyond the REACH CSA

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

Ethylenediamine, EDA

**Identified use name:** Formulation - Industrial  
**Process Category:** PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02  
**Market sector by type of chemical product:** Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

<b>Amounts used:</b>	100440 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	100%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	50%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	365
<b>Environment factors not influenced by risk management:</b>	River flow rate: 18000 m <sup>3</sup> /d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	
<b>Release fraction to air from process (initial release prior to RMM)</b>	0.1%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0.0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	0.2%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 98.8%
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.
<b>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of</b>	Not available.

Ethylenediamine, EDA

**Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.

<b>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of</b>	Not available.
<b>Conditions and measures related to municipal sewage treatment plant:</b>	Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.
<b>Maximum release for RCR &lt;1 :</b>	3.43 kg/day
<b>Scaling factors:</b>	If dilution factor* is increased to ... no additional RMM necessary for RCR < 1: >820

<b>Section 2.2 Control of worker exposure</b>	
<b>Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure</b>	
<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

<b>Section 2.2 Control of worker exposure</b>	
<b>Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure</b>	
<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Outdoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

<b>Section 2.2 Control of worker exposure</b>	
<b>Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</b>	
<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)

<b>Ethylenediamine, EDA</b>	<p><b>Identified use name:</b> Manufacture of substance - Industrial</p> <p><b>Process Category:</b> PROC01, PROC02, PROC08b, PROC15, PROC08a</p> <p><b>Substance supplied to that use in form of:</b> As such</p> <p><b>Sector of end use:</b> SU03</p> <p><b>Subsequent service life relevant for that use:</b> No.</p> <p><b>Environmental Release Category:</b> ERC01</p> <p><b>Market sector by type of chemical product:</b> Not applicable.</p>
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<b>Other given operational conditions affecting workers exposure:</b>	Indoor use/Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :97% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 3: Use a laboratory reagent

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure:1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor use/Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day:< 15 min. Frequency :240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces : Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Outdoor use Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% , eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

**Ethylenediamine, EDA**

**Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.



### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

##### Contributing scenario controlling environmental exposure for 0: Manufacture of substances

	<b>Release from point source (local exposure estimation) kg/ day</b>	<b>Total release for regional exposure estimation kg/day</b>	<b>Justification</b>
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PEC <sub>stp</sub> ) mg/l	0.15	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	0.0159	Not applicable.
Marine water mg/l	Not applicable.	0.00159	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	1.66	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	0.166	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.100	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.187	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3.2 Workers - Exposure estimation

##### Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
Long term exposure, Systemic, Dermal	Not applicable.	0.0068	Not applicable
Long term exposure, Systemic, Inhalable	Not applicable.	0.025	Monitoring methods and references: <100 µg/m <sup>3</sup>
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable
Long term exposure, Local, Inhalable	Not applicable.	0.025	Monitoring methods and references: <100 µg/m <sup>3</sup>
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.

**Short term exposure, Systemic, Combined**

<b>Short term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure**

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Not applicable.	0.027	Not applicable
<b>Long term exposure, Systemic, Inhalable</b>	Not applicable.	17.143	Monitoring methods and references: <100 µg/m³
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable
<b>Long term exposure, Local, Inhalable</b>	Not applicable.	17.143	Monitoring methods and references: <100 µg/m³
<b>Short term exposure, Systemic, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities**

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Not applicable.	0.0137	Not applicable
<b>Long term exposure, Systemic, Inhalable</b>	Not applicable.	2.25	Monitoring methods and references: <0.2 mg/m³
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable
<b>Long term exposure, Local, Inhalable</b>	Not applicable.	2.25	Monitoring methods and references: <0.2 mg/m³
<b>Short term exposure, Systemic, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 3: Use a laboratory reagent**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0007	Not applicable
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Monitoring methods and references: <100 µg/m <sup>3</sup>
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable
Long term exposure, Local, Inhalable	Not applicable.	2.506	Monitoring methods and references: <100 µg/m <sup>3</sup>
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.27	Not applicable
Long term exposure, Systemic, Inhalable	Not applicable.	8.75	Monitoring methods and references :<0.2 mg/m <sup>3</sup>
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable
Long term exposure, Local, Inhalable	Not applicable.	8.75	Monitoring methods and references: <100 µg/m <sup>3</sup>
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 4: Guidance to check compliance with the exposure scenario**

Environment	Not available.
Health	Not available.

**Section 5. Remarks: Additional good practice advice beyond the REACH CSA**

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Manufacture of substance - Industrial  
**Process Category:** PROC01, PROC02, PROC08b, PROC15, PROC08a  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01  
**Market sector by type of chemical product:** Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

**Contributing scenario controlling environmental exposure for 0: Industrial use resulting in manufacture of another substance (use of intermediates)**

<b>Amounts used:</b>	4000 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	100%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	10%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	220
<b>Environment factors not influenced by risk management:</b>	River flow rate: 18000 m <sup>3</sup> /d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	FEICA SPERC 5.1b.v1
<b>Release fraction to air from process (initial release prior to RMM)</b>	0.017%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	0%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.

Ethylenediamine, EDA

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day
<b>Section 2.1 Control of environmental exposure</b>	
<b>Contributing scenario controlling environmental exposure for 1: Industrial use of reactive processing aids</b>	
<b>Amounts used:</b>	4000 Tonnes/year
Fraction of EU tonnage used in region	100%
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	10%
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
<b>Frequency and duration of use:</b>	
Emission Days (days/year)	220
<b>Environment factors not influenced by risk management:</b>	River flow rate: 18000 m <sup>3</sup> /d
Local freshwater dilution factor	Not available.
Local marine water dilution factor	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	FEICA SPERC 5.1b.v1
Release fraction to air from process (initial release prior to RMM)	0.017%
Release fraction to soil from process (initial release prior to RMM)	0%
Release fraction to wastewater from process (initial release prior to RMM)	0%
Release fraction to air from wide dispersive use (regional only)	Not available.
Release fraction to soil from wide dispersive use (regional only)	Not available.
Release fraction to wastewater from wide dispersive use	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant
Treat air emission to provide a typical removal efficiency of	Not available.
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

## Section 2.1 Control of environmental exposure

### Contributing scenario controlling environmental exposure for 2: Industrial use of monomers for manufacture of thermoplastics

<b>Amounts used:</b>	4000 Tonnes/year
Fraction of EU tonnage used in region	100%
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	10%
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
<b>Frequency and duration of use:</b>	
Emission Days (days/year)	220
<b>Environment factors not influenced by risk management:</b>	River flow rate: 18000 m <sup>3</sup> /d
Local freshwater dilution factor	Not available.
Local marine water dilution factor	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	FEICA SPERC 5.1b.v1
Release fraction to air from process (initial release prior to RMM)	0.017%
Release fraction to soil from process (initial release prior to RMM)	0%
Release fraction to wastewater from process (initial release prior to RMM)	0%
Release fraction to air from wide dispersive use (regional only)	Not available.
Release fraction to soil from wide dispersive use (regional only)	Not available.
Release fraction to wastewater from wide dispersive use	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant
Treat air emission to provide a typical removal efficiency of	Not available.
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
<b>Conditions and measures related to municipal sewage treatment plant:</b>	Sewage treatment plant discharge: 2000000 L/day

## Section 2.1 Control of environmental exposure

### Contributing scenario controlling environmental exposure for 3: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

<b>Amounts used:</b>	
Fraction of EU tonnage used in region	Not available.
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	Not available.
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
<b>Frequency and duration of use:</b>	
Emission Days (days/year)	Not available.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

**Environment factors not influenced by risk management:**

Local freshwater dilution factor Not available.  
Local marine water dilution factor Not available.

**Other given operational conditions affecting environmental exposure:**

Release fraction to air from process (initial release prior to RMM) Not available.  
Release fraction to soil from process (initial release prior to RMM) Not available.  
Release fraction to wastewater from process (initial release prior to RMM) Not available.  
Release fraction to air from wide dispersive use (regional only) Not available.  
Release fraction to soil from wide dispersive use (regional only) Not available.  
Release fraction to wastewater from wide dispersive use Not available.

**Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:**

Treat air emission to provide a typical removal efficiency of Not available.  
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of Not available.  
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of Not available.

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

**Section 2.2 Control of worker exposure**

**Contributing scenario controlling worker exposure for 0: Spraying in industrial settings and applications**

**Product characteristics:**

Fugacity: Medium  
Concentration of substance in product: Covers concentrations up to 1-5%  
Physical state: liquid preparations . Vapour pressure :1300Pa\*s

**Amounts used:**

Not applicable.

**Frequency and duration of use:**

Exposure duration per day: >4 hours  
Frequency: =240 days per year

**Human factors not influenced by risk management:**

Exposed skin surfaces : Both hands and forearms (1980 cm<sup>2</sup>)

**Other given operational conditions affecting workers exposure:**

Indoor useIndustrial use

**Ventilation control measures:**

With local exhaust ventilation :95% efficiency

**Personal protection:**

Chemical-resistant gloves. :98% ,eye protection (e.g. protective goggles). Protective clothing

**Respiratory protection:**

None.

**Section 2.2 Control of worker exposure**

**Contributing scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

**Product characteristics:**

Fugacity: Medium  
Concentration of substance in product: Covers concentrations up to 1-5%  
Physical state: liquid preparations . Vapour pressure :1300Pa\*s

**Amounts used:**

Not applicable.

**Frequency and duration of use:**

Exposure duration per day: >4 hours  
Frequency: =240 days per year

**Human factors not influenced by risk management:**

Exposed skin surfaces: Palm of both hands (480 cm<sup>2</sup>)

**Other given operational conditions affecting workers exposure:**

Indoor useIndustrial use

**Ventilation control measures:**

With local exhaust ventilation :90% efficiency

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial

**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU03

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d

**Market sector by type of chemical product:** PC01, PC09a



**Personal protection:** Chemical-resistant gloves. :98% ,eye protection (e.g. protective goggles). Protective clothing

**Respiratory protection:** None.

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 2: Roller application or brushing of adhesive and other coating

**Product characteristics:** Fugacity: Medium

**Concentration of substance in product:** Covers concentrations up to 1-5%

**Physical state:** liquid preparations . Vapour pressure :1300Pa\*s

**Amounts used:** Not applicable.

**Frequency and duration of use:** Exposure duration per day: >4 hours  
Frequency: =240 days per year

**Human factors not influenced by risk management:** Exposed skin surfaces : Both hands (960 cm2)

**Other given operational conditions affecting workers exposure:** Indoor useIndustrial use

**Ventilation control measures:** With local exhaust ventilation :90% efficiency

**Personal protection:** Chemical-resistant gloves. :98% ,eye protection (e.g. protective goggles). Protective clothing

**Respiratory protection:** None.

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 3: Treatment of articles by dipping and pouring

**Product characteristics:** Fugacity: Medium

**Concentration of substance in product:** Covers concentrations up to 1-5%

**Physical state:** liquid preparations . Vapour pressure :1300Pa\*s

**Amounts used:** Not applicable.

**Frequency and duration of use:** Exposure duration per day: >4 hours  
Frequency: =240 days per year

**Human factors not influenced by risk management:** Exposed skin surfaces: Palm of both hands (480 cm2)

**Other given operational conditions affecting workers exposure:** Indoor useIndustrial use

**Ventilation control measures:** With local exhaust ventilation :90% efficiency

**Personal protection:** Chemical-resistant gloves. :98% ,eye protection (e.g. protective goggles). Protective clothing

**Respiratory protection:** None.

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 4: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

**Product characteristics:** Liquid.

**Concentration of substance in product:** Covers concentrations up to 1-5%

**Physical state:** liquid preparations . Vapour pressure :1300Pa\*s

**Amounts used:** Not applicable.

**Frequency and duration of use:** Exposure duration per day: >4 hours  
Frequency: =240 days per year

**Human factors not influenced by risk management:** Exposed skin surfaces: Palm of both hands (480 cm2)

**Other given operational conditions affecting workers exposure:** Indoor useIndustrial use

**Ventilation control measures:** With local exhaust ventilation :90% efficiency

**Personal protection:** Chemical-resistant gloves. :98% ,eye protection (e.g. protective goggles). Protective clothing

**Respiratory protection:** None.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial

**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU03

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d

**Market sector by type of chemical product:** PC01, PC09a

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Industrial use resulting in manufacture of another substance (use of intermediates)

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	1.46E-05	Not applicable.
Marine water mg/l	Not applicable.	2.60E-06	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	1.52E-03	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	2.71E-04	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.021	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.033	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Industrial use of reactive processing aids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

<b>Fresh water mg/l</b>	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Not applicable.	Not applicable.	1.46E-05	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	2.60E-06	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	1.52E-03	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	2.71E-04	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	0.021	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.033	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

### Section 3.1 Environment - Exposure estimation

#### Contributing scenario controlling environmental exposure for 2: Industrial use of monomers for manufacture of thermoplastics

	<b>Release from point source (local exposure estimation) kg/day</b>	<b>Total release for regional exposure estimation kg/day</b>	<b>Justification</b>
<b>Waste water</b>	Not applicable.	Not applicable.	Not applicable.
<b>Surface water</b>	Not applicable.	Not applicable.	Not applicable.
<b>air (direct + STP)</b>	Not applicable.	Not applicable.	Not applicable.
<b>Soil (direct releases only)</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
<b>Concentration in sewage (PECstp) mg/l</b>	Not applicable.	Not applicable.	
<b>Concentration in sewage sludge mg/kg dwt</b>	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Fresh water mg/l</b>	Not applicable.	1.46E-05	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	2.60E-06	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	1.52E-03	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	2.71E-04	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	0.021	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.033	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	1.46E-05	Not applicable.
Marine water mg/l	Not applicable.	2.60E-06	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	1.52E-03	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	2.71E-04	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.021	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.033	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Spraying in industrial settings and applications

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.002	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	1.566	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	1.566	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

Ethylenediamine, EDA

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
<b>Section 3.2 Workers - Exposure estimation</b>			
<b>Contributing scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</b>			
<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
Long term exposure, Systemic, Dermal	Not applicable.	0.00014	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.626	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	0.626	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

<b>Section 3.2 Workers - Exposure estimation</b>			
<b>Contributing scenario controlling worker exposure for 2: Roller application or brushing of adhesive and other coating</b>			
<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
Long term exposure, Systemic, Dermal	Not applicable.	0.0007	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.626	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	0.626	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

<b>Section 3.2 Workers - Exposure estimation</b>			
<b>Contributing scenario controlling worker exposure for 3: Treatment of articles by dipping and pouring</b>			
<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
Long term exposure, Systemic, Dermal	Not applicable.	0.0014	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.626	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

Long term exposure, Local, Inhalable	Not applicable.	0.626	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 4: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.00007	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.626	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	0.626	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

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

Environment	Not available.
Health	Not available.

### Section 5. Remarks: Additional good practice advice beyond the REACH CSA

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Industrial  
**Process Category:** PROC07, PROC08a, PROC10, PROC13, PROC05  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06b, ERC06c, ERC06d  
**Market sector by type of chemical product:** PC01, PC09a

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08c, ERC08f  
**Market sector by type of chemical product:** PC01, PC09a

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Wide dispersive indoor use resulting in inclusion into or onto a matrix

<b>Amounts used:</b>	4000 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	10%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	0.2%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	365
<b>Environment factors not influenced by risk management:</b>	River flow rate:18000 m <sup>3</sup> /d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	FEICA SPERC 8c.1a.v1
<b>Release fraction to air from process (initial release prior to RMM)</b>	0.0%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	1.5%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.

Ethylenediamine, EDA

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08c, ERC08f  
**Market sector by type of chemical product:** PC01, PC09a



Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day
<b>Section 2.1 Control of environmental exposure</b>	
<b>Contributing scenario controlling environmental exposure for 1: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</b>	
Amounts used:	4000 Tonnes/year
Fraction of EU tonnage used in region	10%
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	0.2%
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
Frequency and duration of use:	
Emission Days (days/year)	365
Environment factors not influenced by risk management:	River flow rate:18000 m <sup>3</sup> /d
Local freshwater dilution factor	Not available.
Local marine water dilution factor	Not available.
Other given operational conditions affecting environmental exposure:	FEICA SPERC 8c.1a.v1
Release fraction to air from process (initial release prior to RMM)	0.0%
Release fraction to soil from process (initial release prior to RMM)	0%
Release fraction to wastewater from process (initial release prior to RMM)	1.5%
Release fraction to air from wide dispersive use (regional only)	Not available.
Release fraction to soil from wide dispersive use (regional only)	Not available.
Release fraction to wastewater from wide dispersive use	Not available.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Waste water to sewage treatment plant
Treat air emission to provide a typical removal efficiency of	Not available.
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08c, ERC08f  
**Market sector by type of chemical product:** PC01, PC09a

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 0: Roller application or brushing of adhesive and other coating

#### Product characteristics:

Fugacity: Medium

#### Concentration of substance in product:

Covers percentage substance in the product up to 1%.

#### Physical state:

liquid preparations . Vapour pressure :1300Pa\*s

#### Amounts used:

Not applicable.

#### Frequency and duration of use:

Exposure duration per day: >4 hours

Frequency: =240 days per year

#### Human factors not influenced by risk management:

Exposed skin surfaces : Both hands (960 cm2)

#### Other given operational conditions affecting workers exposure:

Indoor/Outdoor use Professional use

#### Ventilation control measures:

Without local exhaust ventilation

#### Personal protection:

Wear suitable gloves. [80% efficiency ] ,eye protection (e.g. protective goggles).

Protective clothing

#### Respiratory protection:

None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 1: Spraying outside industrial settings and/or applications

#### Product characteristics:

Fugacity: Medium

#### Concentration of substance in product:

Covers percentage substance in the product up to 1%.

#### Physical state:

liquid preparations . Vapour pressure :1300Pa\*s

#### Amounts used:

Not applicable.

#### Frequency and duration of use:

Exposure duration per day: >4 hours

Frequency: =240 days per year

#### Human factors not influenced by risk management:

Exposed skin surfaces: Palm of both hands (480 cm2)

#### Other given operational conditions affecting workers exposure:

Indoor/Outdoor use Professional use

#### Ventilation control measures:

Without local exhaust ventilation

#### Personal protection:

Wear suitable gloves. [80% efficiency ] ,eye protection (e.g. protective goggles).

Protective clothing

#### Respiratory protection:

half-face mask [90% efficiency ]

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 2: Treatment of articles by dipping and pouring

#### Product characteristics:

Fugacity: Medium

#### Concentration of substance in product:

Covers concentrations up to 1-5%

#### Physical state:

liquid preparations . Vapour pressure :1300Pa\*s

#### Amounts used:

Not applicable.

#### Frequency and duration of use:

Exposure duration per day: >4 hours

Frequency: =240 days per year

#### Human factors not influenced by risk management:

Exposed skin surfaces: Palm of both hands (480 cm2)

#### Other given operational conditions affecting workers exposure:

Indoor use Professional use

#### Ventilation control measures:

With local exhaust ventilation :80% efficiency

#### Personal protection:

Wear suitable gloves. [80% efficiency ] ,eye protection (e.g. protective goggles).

Protective clothing

#### Respiratory protection:

None.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional

**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU22

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC08c, ERC08f

**Market sector by type of chemical product:** PC01, PC09a

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 3: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers concentrations up to 1-5%
<b>Physical state:</b>	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Method Detail:</b>	
<b>Activity class:</b>	Open liquid surfaces, agitated surfaces
<b>Surface area- Open (m<sup>2</sup>):</b>	< 0.1
<b>Primary controls:</b>	None.
<b>Secondary controls:</b>	None.
<b>Location:</b>	Indoor
<b>Room size:</b>	Large workrooms
<b>Ventilation rate:</b>	Provide enhanced general ventilation by mechanical means. :3 ACH
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Professional use
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Personal protection:</b>	Wear suitable gloves. [80% efficiency ] ,eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers concentrations up to 1-5%
<b>Physical state:</b>	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Method Detail:</b>	
<b>Activity class:</b>	Falling liquids
<b>Flow rate (L/min) :</b>	10-100
<b>Level of containment:</b>	Open
<b>Transfer loading type:</b>	Splash loading
<b>Primary controls:</b>	None.
<b>Secondary controls:</b>	None.
<b>Location:</b>	Indoor
<b>Room size:</b>	Large workrooms
<b>Ventilation rate:</b>	Provide enhanced general ventilation by mechanical means. :3 ACH
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces : Both hands (960 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Professional use
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Personal protection:</b>	Wear suitable gloves. [80% efficiency ] ,eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional

**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU22

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC08c, ERC08f

**Market sector by type of chemical product:** PC01, PC09a

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Wide dispersive indoor use resulting in inclusion into or onto a matrix

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	1.75E-03	Not applicable.
Marine water mg/l	Not applicable.	1.74E-04	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	0.18	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	0.018	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	1.49E-05	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	1.49E-05	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08c, ERC08f  
**Market sector by type of chemical product:** PC01, PC09a

	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Fresh water mg/l</b>	Not applicable.	1.75E-03	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	1.74E-04	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	0.18	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	0.018	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	1.49E-05	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	1.49E-05	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 0: Roller application or brushing of adhesive and other coating

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Indoor use Outdoor use	0.054	Not applicable.
<b>Long term exposure, Systemic, Inhalable</b>	Indoor use Outdoor use	2.506 ,1.754	Not applicable.
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Inhalable</b>	Indoor use Outdoor use	2.506 ,1.754	Not applicable.
<b>Short term exposure, Systemic, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 1: Spraying outside industrial settings and/or applications

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Indoor use Outdoor use	0.214	Not applicable.
<b>Long term exposure, Systemic, Inhalable</b>	Indoor use Outdoor use	1.253 ,0.877	Not applicable.
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Inhalable</b>	Indoor use Outdoor use	1.253 ,0.877	Not applicable.
<b>Short term exposure, Systemic, Dermal</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional  
**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08c, ERC08f  
**Market sector by type of chemical product:** PC01, PC09a

Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 2: Treatment of articles by dipping and pouring

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0068	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 3: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Indoor use Outdoor use	0.0006 ,0.137	Not applicable.
Long term exposure, Systemic, Inhalable	Indoor use Outdoor use	12.52 ,8.77	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Indoor use Outdoor use	12.52 ,8.77	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

Ethylenediamine, EDA

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional

**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU22

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC08c, ERC08f

**Market sector by type of chemical product:** PC01, PC09a

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

<b>Route of exposure</b>	<b>Contributing scenarios</b>	<b>Dose/Concentration</b>	<b>Justification</b>
<b>Long term exposure, Systemic, Dermal</b>	Indoor use Outdoor use	0.0006 ,0.137	Not applicable.
<b>Long term exposure, Systemic, Inhalable</b>	Indoor use Outdoor use	12.529 ,8.77	Not applicable.
<b>Long term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Long term exposure, Local, Inhalable</b>	Indoor use Outdoor use	12.529 ,8.77	Not applicable.
<b>Short term exposure, Systemic, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Systemic, Combined</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Dermal</b>	Not applicable.	Not applicable.	Not applicable.
<b>Short term exposure, Local, Inhalable</b>	Not applicable.	Not applicable.	Not applicable.

**Section 4: Guidance to check compliance with the exposure scenario**

<b>Environment</b>	Not available.
<b>Health</b>	Not available.

**Section 5. Remarks: Additional good practice advice beyond the REACH CSA**

<b>Environment</b>	Not applicable.
<b>Health</b>	Not applicable.
<b>Additional Good Practices</b>	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Monomer use in epoxy, PU, adhesives, coatings and other polymers - Professional

**Process Category:** PROC10, PROC11, PROC13, PROC05, PROC08a

**Substance supplied to that use in form of:** In a mixture

**Sector of end use:** SU22

**Subsequent service life relevant for that use:** No.

**Environmental Release Category:** ERC08c, ERC08f

**Market sector by type of chemical product:** PC01, PC09a



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Industrial use of processing aids in processes and products, not becoming part of articles

<b>Amounts used:</b>	22100 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	100%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	10%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	365
<b>Environment factors not influenced by risk management:</b>	River flow rate:18 000 m <sup>3</sup> /d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	
<b>Release fraction to air from process (initial release prior to RMM)</b>	0.00025%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0.0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	0.0%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Waste water to sewage treatment plant via incineration , Ion exchange
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.

Ethylenediamine, EDA

*Identified use name:* Use as a process additive - Industrial  
*Process Category:* PROC01, PROC02, PROC03  
*Substance supplied to that use in form of:* In a mixture  
*Sector of end use:* SU03  
*Subsequent service life relevant for that use:* No.  
*Environmental Release Category:* ERC04, ERC07  
*Market sector by type of chemical product:* Not applicable.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge:2000000 L/day
<b>Section 2.1 Control of environmental exposure</b>	
<b>Contributing scenario controlling environmental exposure for 1: Industrial use of substances in closed systems</b>	
Amounts used:	22100 Tonnes/year
Fraction of EU tonnage used in region	100%
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	0.046%
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
Frequency and duration of use:	
Emission Days (days/year)	20
Environment factors not influenced by risk management:	River flow rate: 18000 m <sup>3</sup> /d
Local freshwater dilution factor	Not available.
Local marine water dilution factor	Not available.
Other given operational conditions affecting environmental exposure:	
Release fraction to air from process (initial release prior to RMM)	0.01%
Release fraction to soil from process (initial release prior to RMM)	0.001%
Release fraction to wastewater from process (initial release prior to RMM)	0.001%
Release fraction to air from wide dispersive use (regional only)	Not available.
Release fraction to soil from wide dispersive use (regional only)	Not available.
Release fraction to wastewater from wide dispersive use	Not available.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Waste water to sewage treatment plant
Treat air emission to provide a typical removal efficiency of	Not available.
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day
Maximum release for RCR <1 :	3.3 kg/day

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers concentrations up to 1-5%
<b>Physical state:</b>	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Industrial use
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Personal protection:</b>	Chemical-resistant gloves. :98% , eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers concentrations up to 1-5%
<b>Physical state:</b>	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Industrial use
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves. :98% , eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 2: Use in closed batch process (synthesis or formulation)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers concentrations up to 1-5%
<b>Physical state:</b>	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Industrial use
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves. :98% , eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Industrial use of processing aids in processes and products, not becoming part of articles

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	0	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	1.19E-05	Not applicable.
Marine water mg/l	Not applicable.	2.11E-06	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	0.001	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	0.002	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.017	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.0266	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Industrial use of substances in closed systems

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	0.024	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

<b>Fresh water mg/l</b>	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
	Not applicable.	0.002	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	0.0002	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
<b>Fresh water sediment mg/kg dwt</b>	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
	Not applicable.	0.26	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	0.026	Not applicable.
<b>Agricultural soil averaged mg/kg dwt</b>	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
	Not applicable.	0.008	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.008	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
<b>During emission mg/m<sup>3</sup></b>	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
<b>Micro-organism mg/l</b>	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.007	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.005	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	0.005	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	5.012	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	5.012	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 2: Use in closed batch process (synthesis or formulation)

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0007	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	1.253	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	1.253	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

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

Environment	Not available.
Health	Not available.

### Section 5. Remarks: Additional good practice advice beyond the REACH CSA

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Industrial  
**Process Category:** PROC01, PROC02, PROC03  
**Substance supplied to that use in form of:** In a mixture  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04, ERC07  
**Market sector by type of chemical product:** Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Wide dispersive indoor use of substances in closed systems

<b>Amounts used:</b>	221000 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	10%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	0.2%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	365
<b>Environment factors not influenced by risk management:</b>	River flow rate:18000 m <sup>3</sup> /d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	
<b>Release fraction to air from process (initial release prior to RMM)</b>	5%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	0%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	
<b>Treat air emission to provide a typical removal efficiency of</b>	Not available.
<b>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of</b>	Not available.

Ethylenediamine, EDA

**Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.



If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day

### Section 2.1 Control of environmental exposure

#### Contributing scenario controlling environmental exposure for 1: Wide dispersive outdoor use of substances in closed systems

<b>Amounts used:</b>	221000 Tonnes/year
Fraction of EU tonnage used in region	10%
Regional use tonnage	Not available.
Fraction of Regional tonnage used locally	0.2%
Annual site tonnage	Not available.
Average Local Daily Tonnage (kg/day):	Not available.
Maximum daily site tonnage	Not available.
<b>Frequency and duration of use:</b>	
Emission Days (days/year)	365
<b>Environment factors not influenced by risk management:</b>	River flow rate:18000 m <sup>3</sup> /d
Local freshwater dilution factor	Not available.
Local marine water dilution factor	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	
Release fraction to air from process (initial release prior to RMM)	5%
Release fraction to soil from process (initial release prior to RMM)	5%
Release fraction to wastewater from process (initial release prior to RMM)	5%
Release fraction to air from wide dispersive use (regional only)	Not available.
Release fraction to soil from wide dispersive use (regional only)	Not available.
Release fraction to wastewater from wide dispersive use	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	
Treat air emission to provide a typical removal efficiency of	Not available.
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of	Not available.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of	Not available.
Conditions and measures related to municipal sewage treatment plant:	Sewage treatment plant discharge: 2000000 L/day

### Section 2.2 Control of worker exposure

#### Contributing scenario controlling worker exposure for 0: Heat and pressure transfer fluids in dispersive use but closed systems

<b>Product characteristics:</b>	Fugacity: Medium
Concentration of substance in product:	Maximum Concentration (%):5
Physical state:	liquid preparations . Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm <sup>2</sup> )

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.

<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Professional use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Technical conditions and measures to control dispersion from source towards the worker:</b>	Use the following local exhaust ventilation types: None.
<b>Personal protection:</b>	None. If exposure can occur: Gloves. eye protection (e.g. protective goggles). Protective clothing
<b>Respiratory protection:</b>	None.

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

##### Contributing scenario controlling environmental exposure for 0: Wide dispersive indoor use of substances in closed systems

	<b>Release from point source (local exposure estimation) kg/day</b>	<b>Total release for regional exposure estimation kg/day</b>	<b>Justification</b>
<b>Waste water</b>	Not applicable.	Not applicable.	Not applicable.
<b>Surface water</b>	Not applicable.	Not applicable.	Not applicable.
<b>air (direct + STP)</b>	Not applicable.	Not applicable.	Not applicable.
<b>Soil (direct releases only)</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
<b>Concentration in sewage (PECstp) mg/l</b>	0.029	Not applicable.	
<b>Concentration in sewage sludge mg/kg dwt</b>	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Fresh water mg/l</b>	Not applicable.	3.27E-03	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	3.27E-04	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	0.34	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	0.034	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	0.016	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.017	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.

### Section 3.1 Environment - Exposure estimation

#### Contributing scenario controlling environmental exposure for 1: Wide dispersive outdoor use of substances in closed systems

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PEC <sub>stp</sub> ) mg/l	0.029	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	3.27E-03	Not applicable.
Marine water mg/l	Not applicable.	3.27E-04	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	0.34	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	0.034	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.016	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.017	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 0: Heat and pressure transfer fluids in dispersive use but closed systems

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.086	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

Ethylenediamine, EDA

**Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.

**Section 4: Guidance to check compliance with the exposure scenario**

Environment	Not available.
Health	Not available.

**Section 5. Remarks: Additional good practice advice beyond the REACH CSA**

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as a process additive - Professional  
**Process Category:** PROC20  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Mono-constituent substance  
**Product name** Ethylenediamine, EDA

Section 1: Title

**Short title of the exposure scenario/List of use descriptors** **Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

**Contributing scenario controlling environmental exposure for 0: Industrial use resulting in manufacture of another substance (use of intermediates)**

<b>Amounts used:</b>	Large scale processes: 100440 Tonnes/year Local release to sewage:100440 Tonnes/year
<b>Fraction of EU tonnage used in region</b>	Large scale processes: 100% Local release to sewage:100%
<b>Regional use tonnage</b>	Not available.
<b>Fraction of Regional tonnage used locally</b>	Large scale processes: 10% Local release to sewage:1%
<b>Annual site tonnage</b>	Not available.
<b>Average Local Daily Tonnage (kg/day):</b>	Not available.
<b>Maximum daily site tonnage</b>	Not available.
<b>Frequency and duration of use:</b>	
<b>Emission Days (days/year)</b>	Large scale processes: 365 Local release to sewage:220
<b>Environment factors not influenced by risk management:</b>	Large scale processes River flow rate:: 18000 m³/d Local release to sewage River flow rate::18000 m³/d
<b>Local freshwater dilution factor</b>	Not available.
<b>Local marine water dilution factor</b>	Not available.
<b>Other given operational conditions affecting environmental exposure:</b>	
<b>Release fraction to air from process (initial release prior to RMM)</b>	Large scale processes:0.1% Local release to sewage: 0.01%
<b>Release fraction to soil from process (initial release prior to RMM)</b>	Large scale processes: 0.0% Local release to sewage: 0.0%
<b>Release fraction to wastewater from process (initial release prior to RMM)</b>	Large scale processes: 0.2% Local release to sewage: 0.7%
<b>Release fraction to air from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to soil from wide dispersive use (regional only)</b>	Not available.
<b>Release fraction to wastewater from wide dispersive use</b>	Not available.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	

Ethylenediamine, EDA

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

	<p>Large scale processes: Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 93.9%</p> <p>Local release to sewage: Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 89.5%</p> <p>Not available.</p> <p>Not available.</p> <p>Not available.</p>
<p>Treat air emission to provide a typical removal efficiency of</p> <p>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of</p> <p>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of</p>	
<p>Conditions and measures related to municipal sewage treatment plant:</p>	<p>Large scale processes: Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.</p> <p>Local release to sewage: Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.</p>
<p>Maximum release for RCR &lt;1 :</p>	<p>Large scale processes: 3.4 kg/day Local release to sewage: 3.4 kg/day</p>
<p>Scaling factors:</p>	<p>Large scale processes: If dilution factor* is increased to ... no additional RMM necessary for RCR &lt; 1: &gt;164 Local release to sewage: If dilution factor* is increased to ... no additional RMM necessary for RCR &lt; 1: &gt;95</p>

## Section 2.1 Control of environmental exposure

### Contributing scenario controlling environmental exposure for 1: Industrial use of monomers for manufacture of thermoplastics

#### Amounts used:

Fraction of EU tonnage used in region

Large scale processes: 100440 Tonnes/year  
Local release to sewage: 100440 Tonnes/year

Regional use tonnage

Large scale processes: 100%  
Local release to sewage: 100%

Fraction of Regional tonnage used locally

Not available.

Annual site tonnage

Large scale processes: 10%  
Local release to sewage: 1%

Average Local Daily Tonnage (kg/day):

Not available.

Maximum daily site tonnage

Not available.

#### Frequency and duration of use:

Emission Days (days/year)

Not available.

Large scale processes: 365  
Local release to sewage: 220

#### Environment factors not influenced by risk management:

Local freshwater dilution factor

Large scale processes River flow rate:: 18000 m<sup>3</sup>/d  
Local release to sewage River flow rate:: 18000 m<sup>3</sup>/d

Local marine water dilution factor

Not available.

Not available.

#### Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to RMM)

Large scale processes: 0.1%  
Local release to sewage: 0.01%

Release fraction to soil from process (initial release prior to RMM)

Large scale processes: 0.0%  
Local release to sewage: 0.0%

Release fraction to wastewater from process (initial release prior to RMM)

Large scale processes: 0.2%  
Local release to sewage: 0.7%

Release fraction to air from wide dispersive use (regional only)

Not available.

Release fraction to soil from wide dispersive use (regional only)

Not available.

Release fraction to wastewater from wide dispersive use

Not available.

Ethylenediamine, EDA

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:</b>	Large scale processes: Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 93.9%
<b>Treat air emission to provide a typical removal efficiency of</b>	Local release to sewage: Waste water to sewage treatment plant Other Risk management measures: Incineration Ion exchange Treatment effectiveness: 89.5%
<b>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of</b>	Not available.
<b>If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of</b>	Not available.
<b>Conditions and measures related to municipal sewage treatment plant:</b>	Large scale processes: Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.  Local release to sewage: Sewage treatment plant discharge: 2000000 L/day Do not apply industrial sludge to natural soils.
<b>Maximum release for RCR &lt;1 :</b>	Large scale processes: 3.4 kg/day Local release to sewage: 3.4 kg/day
<b>Scaling factors:</b>	Large scale processes: If dilution factor* is increased to ... no additional RMM necessary for RCR < 1: >164 Local release to sewage: If dilution factor* is increased to ... no additional RMM necessary for RCR < 1: >95

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor/Outdoor use Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% ,eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Outdoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency

**Ethylenediamine, EDA**

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.



<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 2: Use in closed batch process (synthesis or formulation)

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 3: Use in batch and other process (synthesis) where opportunity for exposure arises

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure :1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of both hands (480 cm2)
<b>Other given operational conditions affecting workers exposure:</b>	Indoor useIndustrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Engineering controls:</b>	With local exhaust ventilation :90% efficiency
<b>Ventilation control measures:</b>	Without local exhaust ventilation
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

## Section 2.2 Control of worker exposure

### Contributing scenario controlling worker exposure for 4: Use a laboratory reagent

<b>Product characteristics:</b>	Fugacity: Medium
<b>Concentration of substance in product:</b>	Covers percentage substance in the product up to 100%
<b>Physical state:</b>	Liquid. Vapour pressure:1300Pa*s
<b>Amounts used:</b>	Not applicable.
<b>Frequency and duration of use:</b>	Exposure duration per day: >4 hours Frequency: =240 days per year
<b>Human factors not influenced by risk management:</b>	Exposed skin surfaces: Palm of one hand (240 cm2)

**Ethylenediamine, EDA**

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

<b>Other given operational conditions affecting workers exposure:</b>	Indoor use/Industrial use
<b>Technical conditions and measures at process level (source) to prevent release:</b>	None.
<b>Ventilation control measures:</b>	With local exhaust ventilation :90% efficiency
<b>Organisational measures to prevent/limit releases, dispersion and exposure:</b>	Not relevant in ECETOC TRA
<b>Personal protection:</b>	Chemical-resistant gloves.: 98% eye protection (e.g. protective goggles).Protective clothing
<b>Respiratory protection:</b>	None.

### Section 3: Exposure estimation

#### Section 3.1 Environment - Exposure estimation

**Contributing scenario controlling environmental exposure for 0: Industrial use resulting in manufacture of another substance (use of intermediates)**

	<b>Release from point source (local exposure estimation) kg/day</b>	<b>Total release for regional exposure estimation kg/day</b>	<b>Justification</b>
<b>Waste water</b>	Not applicable.	Not applicable.	Not applicable.
<b>Surface water</b>	Not applicable.	Not applicable.	Not applicable.
<b>air (direct + STP)</b>	Not applicable.	Not applicable.	Not applicable.
<b>Soil (direct releases only)</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
<b>Concentration in sewage (PEC<sub>stp</sub>) mg/l</b>	0.14	Not applicable.	
<b>Concentration in sewage sludge mg/kg dwt</b>	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Fresh water mg/l</b>	Not applicable.	0.0159	Not applicable.
<b>Marine water mg/l</b>	Not applicable.	1.59E-03	Not applicable.
<b>Intermittent release. mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
<b>Fresh water sediment mg/kg dwt</b>	Not applicable.	1.66	Not applicable.
<b>Marine water sediment mg/kg dwt</b>	Not applicable.	0.166	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
<b>Agricultural soil averaged mg/kg dwt</b>	Not applicable.	0.031	Not applicable.
<b>Grassland averaged mg/kg dwt</b>	Not applicable.	0.049	Not applicable.
<b>Groundwater mg/l</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
<b>During emission mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual average mg/m<sup>3</sup></b>	Not applicable.	Not applicable.	Not applicable.
<b>Annual deposition mg/m<sup>2</sup>/d</b>	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
<b>Micro-organism mg/l</b>	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

### Section 3.1 Environment - Exposure estimation

#### Contributing scenario controlling environmental exposure for 1: Industrial use of monomers for manufacture of thermoplastics

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	Not applicable.	Not applicable.
Surface water	Not applicable.	Not applicable.	Not applicable.
air (direct + STP)	Not applicable.	Not applicable.	Not applicable.
Soil (direct releases only)	Not applicable.	Not applicable.	Not applicable.
	<b>Value</b>	<b>Justification</b>	
Concentration in sewage (PECstp) mg/l	0.14	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Fresh water mg/l	Not applicable.	0.0159	Not applicable.
Marine water mg/l	Not applicable.	1.59E-03	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC sediment (local+regional)</b>	<b>Justification</b>
Fresh water sediment mg/kg dwt	Not applicable.	1.66	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.	0.166	Not applicable.
	<b>Local concentration</b>	<b>PEC soil (local+regional)</b>	<b>Justification</b>
Agricultural soil averaged mg/kg dwt	Not applicable.	0.031	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	0.049	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC air (local+regional)</b>	<b>Justification</b>
During emission mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m <sup>3</sup>	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m <sup>2</sup> /d	Not applicable.	Not applicable.	Not applicable.
	<b>Local concentration</b>	<b>PEC aquatic (local+regional)</b>	<b>Justification</b>
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 0: Use in closed process, no likelihood of exposure

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0068	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.025	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	0.025	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

Ethylenediamine, EDA

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 2: Use in closed batch process (synthesis or formulation)**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.000686	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	6.265	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	6.265	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

**Section 3.2 Workers - Exposure estimation****Contributing scenario controlling worker exposure for 3: Use in batch and other process (synthesis) where opportunity for exposure arises**

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.013714	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	5.012	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	5.012	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.

Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

### Section 3.2 Workers - Exposure estimation

#### Contributing scenario controlling worker exposure for 4: Use a laboratory reagent

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.000686	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	2.506	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	2.506	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

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

Environment	Not available.
Health	Not available.

#### Section 5. Remarks: Additional good practice advice beyond the REACH CSA

Environment	Not applicable.
Health	Not applicable.
Additional Good Practices	Not applicable.

**Ethylenediamine, EDA**

**Identified use name:** Use as an intermediate - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC15  
**Substance supplied to that use in form of:** As such  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC06a, ERC06c  
**Market sector by type of chemical product:** Not applicable.