## SAFETY DATA SHEET



#### Pentaethylenehexamine, PEHA

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

#### 1.1 Product identifier

Product name : Pentaethylenehexamine, PEHA

 Index number
 : 612-064-00-2

 EC number
 : 223-775-9

#### **REACH Registration number**

Registration number	Legal entity
01-2119485826-22-0000	Delamine BV

CAS number : 4067-16-7

Product description : Not applicable

Product type : Liquid.

Other means of : 3,6,9,12-tetraazatetradecamethylenediamine; Pentaethylenehexamine; 3,6,9,

identification 12-Tetraazatetradecane-1,14-diamine; pentacthylenehexamine

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

**Product use** : Adhesives, binding agents Dye. Pigments. Complexing agents Fuel. Fuel additive.

Impregnation agents Intermediate. Lubricants and additives Laboratory activities

Pharmaceuticals. Surface-active agents

**Area of application** : Industrial applications.

#### **Identified uses**

#### consumer uses of ethyleneamines

Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0. 5% - Industrial

Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0. 5% - Professional

Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% - Professional

Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% - Industrial

Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% - Industrial

Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% - Industrial

Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0. 5% - Industrial

Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% - Professional

Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0. 5% - Professional

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Industrial

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form -

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

Use of preparations containing EA up to 15% - Professional

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form -Use of preparations containing EA up to 2% - Professional

Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form -Use of preparations containing EA up to 0.5% - Professional

Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

#### 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

: SDS.Delamine@delamine.com

responsible for this SDS

#### 1.4 Emergency telephone number

**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

: UVCB **Product definition** 

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

Acute Tox. 4, H302 Acute Tox. 4. H312 Skin Corr. 1B. H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

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

Xn: R21/22 C: R34 R43

N: R50/53

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** 







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#### **SECTION 2: Hazards identification**

Signal word

: Danger

**Hazard statements** 

Harmful if swallowed or in contact with skin. Causes severe skin burns and eye damage.

May cause an allergic skin reaction.

Very toxic to aquatic life with long lasting effects.

#### **Precautionary statements**

**Prevention** 

: Wear protective gloves: > 8 hours (breakthrough time): neoprene. Wear eye or face protection. Wear protective clothing. Avoid release to the environment.

Response

: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Immediately call a POISON CENTER or physician. IF IN EYES:

Immediately call a POISON CENTER or physician.

**Storage** 

: Store locked up.

**Disposal** 

Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazardous ingredients** 

3.6,9,12-tetra-azatetradecamethylenediamine

Supplemental label

: Not applicable.

elements

: Not applicable.

**Annex XVII - Restrictions** on the manufacture. placing on the market and use of certain dangerous substances, mixtures and articles

**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

: UVCB Substance/mixture

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## **SECTION 3: Composition/information on ingredients**

			Classification		
Product/ingredient name	Identifiers	%	67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	Туре
3,6,9,12-tetra- azatetradecamethylenediamine	REACH #: 01-2119485826-22 EC: 223-775-9 CAS: 4067-16-7 Index: 612-064-00-2	100	Xn; R21/22 C; R34 R43 N; R50/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	[*]
3,6,9,12-tetra- azatetradecamethylenediamine	EC: 223-775-9 CAS: 4067-16-7 Index: 612-064-00-2	70.9 - 78.9	Xn; R21/22 C; R34 R43 N; R50/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	[A]
amines, polyethylenepoly-	EC: 268-626-9 CAS: 68131-73-7 Index: 612-121-00-1	16.5 - 24.5	Xn; R21/22 C; R34 R43 N; R50/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	[A]
			See Section 16 for the full text of the R- phrases declared above.	See Section 16 for the full text of the H statements declared above.	

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

- [\*] Substance
- [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.

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### **SECTION 4: First aid measures**

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.

Ingestion

est 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

: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact

: Causes severe burns. Harmful in contact with skin. May cause an allergic skin reaction.

Ingestion

: Harmful if swallowed. May cause burns to mouth, throat and stomach.

#### Over-exposure signs/symptoms

**Eye contact** 

: Adverse symptoms may include the following:

pain watering redness

Inhalation

: No specific data.

**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.

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## SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media

: Use an extinguishing agent suitable for the surrounding fire.Dry sand or other suitable absorbent. Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.

Unsuitable extinguishing media

: Halones

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

Hazards from the substance or mixture

: In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic 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

#### 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.

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

nitrogen oxides

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. 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".

## **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. Collect spillage.

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

**Small spill** 

: Stop leak if without risk. Move containers from spill area. 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. 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.

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#### SECTION 6: Accidental release measures

## 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 sensitization problems 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. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. 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

Store in accordance with local regulations. 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. Separate from acids. 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 II Directive - Reporting thresholds (in tonnes)

#### **Danger criteria**

	Notification and MAPP threshold	Safety report threshold
	100	200
C9i: Very toxic for the environment	100	200

#### 7.3 Specific end use(s)

Recommendations : No specific data.

Industrial sector specific : No specific data.

solutions

## **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**

No exposure limit value known.

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## **SECTION 8: Exposure controls/personal protection**

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**

Product/ingredient name	Type	Exposure	Value	Population	Effects
3,6,9,12-tetra- azatetradecamethylenediamine	DNEL	Short term Inhalation	8550 mg/ m³	Workers	Systemic
·	DNEL	Long term Dermal	0.91 mg/ kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	1.59 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	0.044 mg/ cm <sup>2</sup>	Workers	Local
	DNEL	Short term Dermal	13 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Inhalation	2542 mg/ m³	Consumers	Systemic
	DNEL	Short term Oral	32 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Dermal	1.59 mg/ cm <sup>2</sup>	Consumers	Local
	DNEL	Long term Dermal	0.4 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	0.46 mg/m <sup>3</sup>	Consumers	Systemic
	DNEL	Long term Oral	0.65 mg/ kg bw/day	Consumers	Systemic
	DNEL	Long term Dermal	0.68 mg/ cm <sup>2</sup>	Consumers	Local

#### **PNECs**

Product/ingredient name	Compartment Detail	Value	Method Detail
3,6,9,12-tetra- azatetradecamethylenediamine	Secondary Poisoning	0.29 mg/kg	Assessment Factors
•	Fresh water	2.5 µg/l	Assessment Factors
	Marine	2.5 µg/l	Assessment Factors
	Fresh water sediment	0.22 mg/kg dwt	-
	Marine water sediment	0.14 mg/kg dwt	-
	Soil	0.18 mg/kg dwt	-
	Sewage Treatment Plant	1.64 mg/l	Assessment Factors

#### 8.2 Exposure controls

Appropriate engineering controls

: If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

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## SECTION 8: Exposure controls/personal protection

#### 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**

#### **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.

#### 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. [Clear.] Colour Yellow. [Light] Odourless. Odour **Odour threshold** Not available.

pН 12 6

Melting point/freezing point : <-70°C Pour point < - 20 C

Initial boiling point and boiling

range

: 426°C

: Closed cup: 183°C Flash point **Evaporation rate** Not available. Flammability (solid, gas) Not applicable. **Burning time** Not applicable. **Burning rate** Not applicable.

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### SECTION 9: Physical and chemical properties

Upper/lower flammability or

explosive limits

Not available.

: 0.0000017 kPa [room temperature] Vapour pressure

Vapour density Not available. **Relative density** Not available.

Solubility(ies)

Solubility in water >500 q/l Partition coefficient: n-octanol/ : -3.67

water

**Auto-ignition temperature** : 335°C

**Decomposition temperature** : Not available. **Viscosity** Not available. **Explosive properties** : Not applicable.

**Oxidising properties** : None.

9.2 Other information

: 1.003 g/cm³ [20°C] **Density** Physical/chemical properties

comments

: No additional information.

## SECTION 10: Stability and reactivity

: No specific test data related to reactivity available for this product or its ingredients. 10.1 Reactivity

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Under normal conditions of storage and use, hazardous polymerisation will not occur.

10.4 Conditions to avoid : Keep away from sources of ignition - No smoking, aerosol or mist formation

: Reactive or incompatible with the following materials: oxidizing materials, metals and 10.5 Incompatible materials

Chlorinated hydrocarbon.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects

#### **Acute toxicity**

Product/ingredient name	Result	Species	Dose	Exposure
3,6,9,12-tetra- azatetradecamethylenediamine	LD50 Oral	Rat	1600 mg/kg	-
3,6,9,12-tetra- azatetradecamethylenediamine	LD50 Oral	Rat	1600 mg/kg	-

Conclusion/Summary Oral Harmful if swallowed.

Dermal Harmful in contact with skin.

Inhalation No applicable toxicity data Not classified as dangerous

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#### Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)

Pentaethylenehexamine, PEHA

## **SECTION 11: Toxicological information**

#### **Irritation/Corrosion**

**Conclusion/Summary** 

Skin : Corrosive to the skin.

Eyes : Corrosive to eyes.

Respiratory : No data available for this end-point, hence this classification is not considered to be

applicable.

#### **Sensitisation**

Product/ingredient name	Route of exposure	Species	Result
3,6,9,12-tetra- azatetradecamethylenediamine	skin	Guinea pig	Sensitising

#### **Conclusion/Summary**

Skin : May cause skin sensitisation.

**Respiratory**: No data available for this end-point, hence this classification is not considered to be

applicable.

#### **Mutagenicity**

Product/ingredient name	Test	Experiment	Result
3,6,9,12-tetra- azatetradecamethylenediamine	-	Experiment: In vivo Subject: Mammalian-Animal Cell: Germ	Negative

**Conclusion/Summary** 

: No mutagenic effect.

**Carcinogenicity** 

Conclusion/Summary : skin No carcinogenic effect.

**Reproductive toxicity** 

Conclusion/Summary : Fertility : No data available for this end-point, hence this classification is not

considered to be applicable.

Developmental Toxicity: No data available for this end-point, hence this classification

is not considered to be applicable.

**Teratogenicity** 

**Conclusion/Summary**: No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

#### **Aspiration hazard**

Not available.

Information on the likely routes of exposure

: Routes of entry anticipated: Oral.

#### Potential acute health effects

**Eye contact** 

: Causes serious eye damage.

Inhalation

: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact** 

: Causes severe burns. Harmful in contact with skin. May cause an allergic skin

reaction.

**Ingestion**: Harmful if swallowed. May cause burns to mouth, throat and stomach.

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

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## **SECTION 11: Toxicological information**

**Eye contact** : Adverse symptoms may include the following:

pain watering redness

Inhalation : No specific data.

**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** 

: No specific data.

effects

Potential delayed effects :

: No specific data.

**Long term exposure** 

**Potential immediate** 

: No specific data.

effects

Potential delayed effects: No specific data.

#### Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
	Sub-chronic LOAEL Oral	Rat	52 mg/kg	-
azatetradecamethylenediamine				

Conclusion/Summary : Not classified as dangerous

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to

very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Absorption: Slowly absorbed.Metabolism: Rapidly metabolised.Elimination: Rapidly excreted.

Other information : No specific data.

## **SECTION 12: Ecological information**

#### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
3,6,9,12-tetra- azatetradecamethylenediamine	EC50 164 mg/l	Micro-organism	2 hours
	Acute EC50 0.7 mg/l Fresh water	Algae	72 hours
	Acute EC50 17.5 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 180 mg/l Fresh water	Fish	96 hours
	Acute NOEC 0.25 mg/l Fresh water	Algae	72 hours
	Chronic NOEC 0.8 mg/l Fresh water	Daphnia	14 days

Conclusion/Summary

: Dangerous for the environment. PNEC Intermittent release.= 0.025 mg/l

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## **SECTION 12: Ecological information**

#### 12.2 Persistence and degradability

**Conclusion/Summary** 

: Not readily biodegradable. This substance is not expected to bioaccumulate through food chains in the environment.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
3,6,9,12-tetra- azatetradecamethylenediamine	-	-	Not readily

#### 12.3 Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
3,6,9,12-tetra- azatetradecamethylenediamine	-3.67	-	low

#### 12.4 Mobility in soil

Soil/water partition coefficient (Koc)

: >3000

Mobility : No specific data.

#### 12.5 Results of PBT and vPvB assessment

PBT : No.

vPvB : №o

**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** 

**Packaging** 

**Methods of disposal** 

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

: 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

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## **SECTION 14: Transport information**

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN2735	UN2735	UN2735	UN2735
14.2 UN proper shipping name	POLYAMINES, LIQUID, CORROSIVE, N.O.S.(3,6,9,12-tetra- azatetradecamethylenediamine)	POLYAMINES, LIQUID, CORROSIVE, N.O.S.(3,6,9,12-tetra- azatetradecamethylenediamine)	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (3,6,9,12-tetra- azatetradecamethylenediamine). Marine pollutant (Amines, polyethylenepoly-)	Polyamines, liquid, corrosive, n.o.s.(3,6,9, 12-tetra-azatetradecamethylenediamine)
14.3 Transport hazard class(es)	8	8	8	8
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	No.
Additional information	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.  Hazard identification number 80  Limited quantity 5 L  Special provisions 274  Tunnel code (E)	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.  Special provisions 274	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.  Emergency schedules (EmS) F-A, S-B  Special provisions 223, 274	The environmentally hazardous substance mark may appear if required by other transportation regulations.  Passenger and Cargo Aircraft Quantity limitation: 5 L Packaging instructions: 852 Cargo Aircraft Only Quantity limitation: 60 L Packaging instructions: 856 Limited Quantities - Passenger Aircraft Quantity limitation: 1 L Packaging instructions: Y841
				Quantity limitation: Packaging instruction

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.

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### 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** 

: Not applicable.

on the manufacture, placing on the market and use of certain dangerous substances, mixtures and

articles

Other EU regulations

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

**Seveso II Directive** 

This product is controlled under the Seveso II Directive.

**Danger criteria** 

Category

1: Hazardous to the aquatic environment - Acute 1 or Chronic 1

C9i: Very toxic for the environment

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.

1272/20081

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 convention concerning international road transport of dangerous goods (ADR) done in Geneva on September 30, 1957 (Dz. U. no. 35/1975, pos. 189) 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
Acute Tox. 4, H302	Expert judgment
Acute Tox. 4, H312	Expert judgment
Skin Corr. 1B, H314	Expert judgment
Eye Dam. 1, H318	Expert judgment
Skin Sens. 1, H317	Expert judgment
Aquatic Acute 1, H400	Expert judgment
Aquatic Chronic 1, H410	Expert judgment

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#### SECTION 16: Other information

Full text of abbreviated H statements

: H302 Harmful if swallowed.

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction. H318 Causes serious eye damage.

Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

Acute Tox. 4. H302 ACUTE TOXICITY (oral) - Category 4 Acute Tox. 4. H312 ACUTE TOXICITY (dermal) - Category 4 ACUTE AQUATIC HAZARD - Category 1 Aguatic Acute 1, H400 Aquatic Chronic 1, H410 LONG-TERM AQUATIC HAZARD - Category 1

Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1

Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B

Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1

Full text of abbreviated R phrases

: R21/22- Harmful in contact with skin and if swallowed.

R34- Causes burns.

R43- May cause sensitisation by skin contact.

R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the

aquatic environment.

Full text of classifications [DSD/DPD]

C - Corrosive Xn - Harmful

H400

N - Dangerous for the environment

**Training advice** 

Ensure operatives are trained to minimise exposures. Training staff on good practice.

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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.

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#### Annex to the extended Safety Data Sheet (eSDS)

Consumer

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

**Section 1: Title** 

Short title of the exposure Identified use name: Consumer uses of ethyleneamines scenario/List of use descriptors Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f

Market sector by type of chemical product: PC01, PC09b

Article category related to subsequent service life: Not applicable.

Processes and activities covered

by the exposure scenario **Assessment Method** 

Not applicable.

See Section 3

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

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 1019 Average Local Daily Tonnage (kg/day)

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk

management:

Local freshwater dilution factor: 1300 1000 Local marine water dilution factor:

Other given operational conditions affecting

environmental exposure:

Release fraction to air from process (initial release prior 0

to RMM):

Release fraction to soil from process (initial release

prior to RMM):

Release fraction to wastewater from process (initial 1

release prior to RMM):

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-

site sewage treatment (%):

Pentaethylenehexamine, PEHA

Total efficiency of removal from wastewater after on-site Not available.

and off-site (domestic treatment plant) RMMs (%):

Maximum allowable site tonnage (Msafe) based on

release following total wastewater treatment removal (kg/d):

Assumed on-site sewage treatment plant flow (m³/d):

Not available

Not available.

Not available.

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f

Contributing scenario controlling environmental exposure for 1: Use of coatings and adhesives

Operational conditions: Not determined

**Product characteristics:** Indoor/Outdoor use.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372

1019 Average Local Daily Tonnage (kg/day) Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk

management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000

Other given operational conditions affecting

environmental exposure:

Release fraction to air from process (initial release prior 0 to RMM):

Release fraction to soil from process (initial release 5 00x10-3

prior to RMM):

Release fraction to wastewater from process (initial 0.1

release prior to RMM):

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-Not available

site sewage treatment (%):

Total efficiency of removal from wastewater after on-site Not available.

and off-site (domestic treatment plant) RMMs (%):

Maximum allowable site tonnage (Msafe) based on

release following total wastewater treatment removal

(kg/d):

Assumed on-site sewage treatment plant flow (m³/d): Not available.

Contributing scenario controlling environmental exposure for 2: Lube oil use

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

372 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 74.4 204 Average Local Daily Tonnage (kg/day)

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk

management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000

Other given operational conditions affecting

environmental exposure:

Release fraction to air from process (initial release prior 0

Release fraction to soil from process (initial release 0

prior to RMM):

Release fraction to wastewater from process (initial 0

release prior to RMM):

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-Not available

site sewage treatment (%):

Not available.

Total efficiency of removal from wastewater after on-site Not available. and off-site (domestic treatment plant) RMMs (%):

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e. ERC08f

Maximum allowable site tonnage ( $M_{\text{Safe}}$ ) based on release following total wastewater treatment removal (kg/d):

Assumed on-site sewage treatment plant flow (m³/d):

Not available.

Not available.

#### Section 2.2: Control of consumer exposure

Contributing scenario controlling consumer exposure for 0: Use in detergents and cleaners, including professional

Physical state: Physical state: liquid

Molecular weight: 146.23 g/mole Vapour pressure: 0.346 Pa\*s at 25°C

#### Contributing scenarios: Operational conditions and risk management measures

Product Category(ies) 1: Adhesives, sealants Mixing and loading

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 20 g
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 1: Adhesives, sealants Application

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 20 g
- Covers use in room size of 20 m3
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 200 g
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay Application

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 200 g
- Covers use in room size of 20 m³
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

#### Section 2.2: Control of consumer exposure

Contributing scenario controlling consumer exposure for 1: Use of coatings and adhesives

Physical state: Physical state: liquid

Molecular weight: 146.23 g/mole Vapour pressure: 0.346 Pa\*s at 25°C

#### Contributing scenarios: Operational conditions and risk management measures

Product Category(ies) 1: Adhesives, sealants Mixing and loading

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 20  $\ensuremath{\text{g}}$
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 1: Adhesives, sealants Application

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 20 g
- Covers use in room size of 20 m³
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f

Market sector by type of chemical product: PC01, PC09b Article category related to subsequent service life: Not applicable.

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 200 g
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay Application

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 200 g
- Covers use in room size of 20 m³
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

#### Section 2.2: Control of consumer exposure

#### Contributing scenario controlling consumer exposure for 2: Lube oil use

**Physical state:** 

Physical state: liquid Molecular weight: 146.23 g/mole Vapour pressure: 0.346 Pa\*s at 25°C

#### Contributing scenarios: Operational conditions and risk management measures

Product Category(ies) 1: Adhesives, sealants Mixing and loading

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 20 g
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 1: Adhesives, sealants Application

Operations Conditions (consumer):

- Covers use up to 3 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 20 g
- Covers use in room size of 20 m3
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 25%
- For each use event, covers use amounts up to 200 g
- Covers exposure up to 5 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 25%

Product Category(ies) 9b: Fillers, putties, plasters, modelling clay Application

Operations Conditions (consumer):

- Covers use up to 2 days/Year
- Covers use up to 5%
- For each use event, covers use amounts up to 200 g
- Covers use in room size of 20 m<sup>3</sup>
- Covers exposure up to 90 minutes/event

Risk Management Measures (consumer): No specific risk management measure identified beyond those operational conditions stated. Avoid using at a product concentration greater than 5%

#### Section 3: Exposure estimation and reference to its source

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f

Section 3:.1	Environment -	Exposure es	timation
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Contributing scenario controlling environmental exposure for 0: Use in detergents and cleaners, including professional

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
	day		=110=0 1 1 11
Waste water	0.382	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231; Regional PEC [ Total ]: 6.87x10-13	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94; Regional PEC natural soil: 3. 75x10-4	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.138	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.06x10-4	8.25x10-3 ;Regional PEC[Total]: 8.19x10-3	EUSES calculation
Marine water mg/l	1.38x10-4	9.39x10-4 ;Regional PEC[Total]: 8.03x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.64; Regional PEC: 4.43	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.300; Regional PEC: 0.371	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.33x10-11	3.75x10-4; Regional PEC [Total]: 3.71x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.43x10-11	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.32x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	7.32x10-13	1.42x10-12	EUSES calculation
Annual deposition mg/m²/d	3.71x10-12	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use of coatings and adhesives

(local exposure estimation) kg/day	exposure estimation kg/day	
0.010	737	EUSES calculation
Not evaluated.	0	EUSES calculation
0	0.231; Regional PEC [ Total ]: 6.87x10-13	EUSES calculation
Not evaluated.	6.94; Regional PEC natural soil: 3. 75x10-4	Not applicable.
Value	Justification	
3.68x10-3	EUSES calculation	
0	EUSES calculation	
Local concentration	PEC aquatic (local+regional)	Justification
2.82x10-6	8.15x10-3	EUSES calculation
3.67x10-6	8.06x10-4	EUSES calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.258	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
	day 0.010 Not evaluated. 0 Not evaluated.  Value 3.68x10-3 0  Local concentration 2.82x10-6 3.67x10-6 Not applicable. Local concentration Not evaluated. Not evaluated.	day         0.010         737           Not evaluated.         0         0.231; Regional PEC [Total]: 6.87x10-13           Not evaluated.         6.94; Regional PEC natural soil: 3. 75x10-4           Value         Justification           3.68x10-3         EUSES calculation           0         EUSES calculation           Local concentration         PEC aquatic (local+regional)           2.82x10-6         8.15x10-3           3.67x10-6         8.06x10-4           Not applicable.         Not applicable.           Local concentration         PEC sediment (local+regional)           Not evaluated.         2.61           Not evaluated.         0.258

Release from point source Total release for regional

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use:  $\mbox{No.}$ 

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f

Market sector by type of chemical product: PC01, PC09b Article category related to subsequent service life: Not applicable.

**Justification** 

Agricultural soil averaged mg/kg 1.15x10-12 3.75x10-4 **EUSES** calculation Grassland averaged mg/kg dwt 2.25x10-12 3.75x10-4 **EUSES** calculation Groundwater mg/l Not evaluated 5.91x10-6 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m<sup>3</sup> 1.95x10-14 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1.95x10-14 7.07x10-13 **EUSES** calculation Annual deposition mg/m²/d 9.90x10-14 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration** Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231; Regional PEC [ Total ]: 6.87x10-13	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94; Regional PEC natural soil: 3. 75x10-4	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4; Regional PEC [Total]: 3.71x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.2 Exposure estimation - Consumers

Exposure estimation and reference to its source - Consumers: 1: Use in detergents and cleaners, including professional

Contributing Frequency (1/Year): Weight fraction of **Body weight: Calculation method:** Scenario: substance in the

article::

3; 3; 2; 2

**Exposure estimation and** reference to its source -Consumers: 0: Use in detergents and cleaners, including professional

Adhesives, sealants -Mixing and loading; Adhesives, sealants -Application(s); Fillers, putties, plasters, modelling clay -Mixing and loading; Fillers, putties, plasters, modelling

clay - Application(s)

25%; 5%; 25%; 5% 60 kg ConsExpo 4.1

Inhalation:

evaporation Mode of release:

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f

Exposure estimation and reference to its source -Consumers: 3: Use in detergents and cleaners, including professional

**Exposure (minutes): Application duration:** Amount/concentration Room volume (m³): Room volume x

applied (g):

ventilation rate: (I/h):

Dermal (Internal dose) mg/kg

ConsExpo 4.1

20; 20; 200; 200 5; 90; 5; 90 5; 30; 5; 30 1; 20; 1; 20 0.6

Release area (cm2): Temperature (°C): Mass transfer rate: Contributing **Uptake fraction** Inhalation rate:

**Scenario Molecular** (Update model):

25%; 5%; 25%; 5%

60 kg

weight (g/mole): 20; 500; 100; 50 20 3.09E+03

32.9 550 1

Dermal:

**Application methods:** instant

Surface area (Skin contact Product amount (g): **Uptake fraction (Update** Inhalation event (mg/m³):

area) cm2: model):

2; 43; 2; 22 0.05; 0.1; 0.02; 1 11.2; 3.0; 11.5; 3.1

Inhalation mg/m<sup>3</sup> Dermal load (mg/cm2): Dermal External dose (mg/kg

(Concentration on day of bw/day:

exposure):

0.039; 0.188; 0.040; 0.191 6.25; 0.12; 2.5; 0.46 0.208; 0.08; 0.08; 1.67 0.002; 0.001; 5E-4; 0.001

Dermal (External dose) mg/kg Inhalation event/Exposure mg/ **Dermal systemic exposure** Inhalation (mg/kg/day) Long

m³ (Short term exposure): (external dose) with gloves bw/day: term exposure:

(90% efficiency) mg/kg bw/day (Long term exposure):

0.0002; 0.0001; 5E-5; 0.0001 0.002; 0.001; 5E-4; 0.001 0.039; 0.188; 0.040; 0.191 11.2; 3.0; 11.5; 3.1

Section 3:.2 Exposure estimation - Consumers

Exposure estimation and reference to its source - Consumers: 5: Use of coatings and adhesives

Contributing Weight fraction of Frequency (1/Year): **Body weight:** Calculation method:

Scenario: substance in the

3.3.2.2

article::

**Exposure estimation and** reference to its source -

Mixing and loading: Adhesives, sealants -Consumers: 2: Use of coatings Application(s); Fillers, and adhesives putties, plasters, modelling clay -Mixing and loading; Fillers, putties,

plasters, modelling clay - Application(s)

Adhesives, sealants -

Inhalation:

evaporation Mode of release:

Exposure estimation and reference to its source -Consumers: 4: Use of coatings and adhesives

**Exposure (minutes): Application duration: Amount/concentration** Room volume x Room volume (m³):

applied (g): ventilation rate: (I/h):

5; 90; 5; 90 5; 30; 5; 30 20; 20; 200; 200 1; 20; 1; 20

Inhalation rate: Contributing **Uptake fraction** Release area (cm2): Temperature (°C): Mass transfer rate:

Scenario Molecular (Update model):

weight (g/mole):

20; 500; 100; 50 3.09E+03 550 32.9 20 1

Dermal:

exposure):

**Application methods:** instant

Pentaethylenehexamine, PEHA

Surface area (Skin contact Product amount (g): **Uptake fraction (Update** Inhalation event (mg/m³):

area) cm2: model):

2; 43; 2; 22 0.05; 0.1; 0.02; 1 11.2; 3.0; 11.5; 3.1

Inhalation mg/m<sup>3</sup> Dermal load (mg/cm2): Dermal External dose (mg/kg Dermal (Internal dose) mg/kg

(Concentration on day of bw): bw/day:

0.039; 0.188; 0.040; 0.191 6.25; 0.12; 2.5; 0.46 0.208; 0.08; 0.08; 1.67 0.002; 0.001; 5E-4; 0.001

Identified use name: Consumer uses of ethyleneamines Sector of end use: SU21

Subsequent service life relevant for that use: No. Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e. ERC08f

Dermal (External dose) mg/kg

bw/dav:

Inhalation event/Exposure mg/ m³ (Short term exposure):

**Dermal systemic exposure** 

(external dose) with gloves (90% efficiency) mg/kg bw/day (Long term exposure):

Inhalation (mg/kg/day) Long

term exposure:

0.039; 0.188; 0.040; 0.191

0.002; 0.001; 5E-4; 0.001

11.2; 3.0; 11.5; 3.1

0.0002; 0.0001; 5E-5; 0.0001

**Section 3:.2 Exposure estimation - Consumers** 

Exposure estimation and reference to its source - Consumers: 9: Lube oil use

Contributing Frequency (1/Year):

3; 3; 2; 2

Scenario:

Weight fraction of substance in the

article::

**Body weight:** 

Calculation method:

ConsExpo 4.1

**Exposure estimation and** reference to its source -Consumers: 7: Lube oil use Adhesives, sealants -Mixing and loading; Adhesives, sealants -

Application(s); Fillers, putties, plasters, modelling clay -Mixing and loading; Fillers, putties, plasters, modelling clay - Application(s)

25%; 5%; 25%; 5% 60 kg

Inhalation:

evaporation Mode of release:

Exposure estimation and reference to its source -

Consumers: 8: Lube oil use

**Amount/concentration** applied (g):

Room volume (m³):

Room volume x ventilation rate: (I/h):

5; 90; 5; 90

5; 30; 5; 30

**Application duration:** 

20; 20; 200; 200

1; 20; 1; 20

Release area (cm2):

20; 500; 100; 50

**Exposure (minutes):** 

Temperature (°C):

20

Mass transfer rate:

Contributing Uptake fraction Scenario Molecular (Update model):

Inhalation rate:

3.09E+03

weight (g/mole):

model):

1

550

32 9

Inhalation event (mg/m³):

Dermal:

**Application methods:** instant

Surface area (Skin contact

area) cm2: 2; 43; 2; 22 Product amount (g):

0.05; 0.1; 0.02; 1

**Uptake fraction (Update** 

11.2; 3.0; 11.5; 3.1

Inhalation mg/m<sup>3</sup>

(Concentration on day of

0.039; 0.188; 0.040; 0.191

0.002; 0.001; 5E-4; 0.001

exposure):

Dermal load (mg/cm2):

6.25; 0.12; 2.5; 0.46

11.2: 3.0: 11.5: 3.1

Dermal External dose (mg/kg

Dermal (Internal dose) mg/kg

bw/day:

Dermal (External dose) mg/kg

bw/day:

Inhalation event/Exposure mg/ m³ (Short term exposure):

**Dermal systemic exposure** (external dose) with gloves (90% efficiency) mg/kg bw/day

0.208; 0.08; 0.08; 1.67

(Long term exposure):

0.002; 0.001; 5E-4; 0.001 Inhalation (mg/kg/day) Long term exposure:

0.0002; 0.0001; 5E-5; 0.0001

0.039: 0.188: 0.040: 0.191

Section 3:.3 Exposure estimation- Consumers

Contributing scenario controlling consumer exposure for 6: Use in detergents and cleaners, including professional

Route of exposure Long term exposure, Systemic,

Not applicable.

**Contributing scenarios** 

**Dose/Concentration** Not applicable.

**Justification** Not applicable.

Long term exposure, Systemic, Not applicable. Inhalable

Not applicable.

Not applicable.

Long term exposure, Systemic,

Not applicable.

Not applicable. Not applicable.

Combined

**Dermal** 

Long term exposure, Local, Dermal Not applicable. Long term exposure, Local, Not applicable. Inhalable

Not applicable. Not applicable. Not applicable. Not applicable.

Long term exposure, Systemic, Oral Not applicable. Short term exposure, Systemic,

Not applicable.

Not applicable. Not applicable. Not applicable. Not applicable.

Short term exposure, Systemic,

Inhalable

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d, ERC08e. ERC08f

Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Short term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.
Section 3:.3 Exposure estimation- Co	onsumers		
Contributing scenario controlling co			
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	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.	Not applicable.	Not applicable.
Long term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable		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.
Short term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.
Section 3:.3 Exposure estimation- Co	onsumers		
Contributing scenario controlling co	onsumer exposure for 11: Lube o	oil use	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	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.	Not applicable.	Not applicable.
Long term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable		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.
Short term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.

#### Section 4:: Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	Not available.	
Health	Not available.	

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f

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

EnvironmentNot applicable.HealthNot applicable.Additional guidanceNot applicable.

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines

Sector of end use: SU21

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of

preparations containing EA up to 0.5% - Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

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

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649 Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

1.00x10-5

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Not available.

Release fraction to soil from wide dispersive use (regional

Not available.

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

Not available. Not applicable.

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

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

No wastewater treatment required.

Treat on-site wastewater (prior to receiving water discharge)

Not available.

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -

Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Not available.

Not available.

300

1.00x10-5

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Continuous release.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: 300 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

Pentaethylenehexamine, PEHA

exposure:

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Release fraction to air from process (initial release prior to 1 00x10-5 RMM):

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant:

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55.1

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

365 Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

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

Release fraction to air from wide dispersive use (regional

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

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not applicable.

Continuous release.

None.

1.00x10-5

1.00x10-4

0.02

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to 5.00x10-3

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

Not available

Not available.

Not available.

Not applicable.

=>27.7

Not available.

**Product characteristics:** Solid. Covers concentrations up to 0.5%

Amounts used: Not applicable. Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Solid. Covers concentrations up to 0.5% **Product characteristics:** 

Amounts used: Not applicable.

Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Indoor. professional setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### **Section 3:: Exposure estimation**

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -

Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

During emission mg/m<sup>3</sup> Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 6.87x10-13 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	EUSES calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.010	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.68x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-6	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	3.67x10-6	8.06x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.258	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Agricultural soil averaged mg/kg 1.15x10-12 3.75x10-4 **EUSES** calculation dwt Grassland averaged mg/kg dwt 2.25x10-12 3.75x10-4 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated. 5.91x10-6 Local concentration PEC air (local+regional) Justification During emission mg/m<sup>3</sup> 1.95x10-14 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1.95x10-14 7.07x10-13 **EUSES** calculation Annual deposition mg/m<sup>2</sup>/d 9.90 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

Route of exposure

Long term exposure, Systemic,
Dermal

Not applicable.

Not applicable.

Dose/Concentration

0.001

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

exposure estimates for other PROC are below this value

Long term exposure, Systemic,
Inhalable

Not applicable.

0.06

The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

**Long term exposure, Systemic,** Not applicable. Not applicable. Not applicable.

Long term exposure, Local, DermalNot applicable.Not applicable.Not applicable.Long term exposure, Local,Not applicableNot applicable.Since the substance is not classified for

Inhalable acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for

Combined acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Not applicable. 0.12 The ECETOC TRA tool has been used to

Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Route of exposure Contributing scenarios Dose/Concentration Justification

Long term exposure, Systemic, Not applicable. 0.001 The ECETOC TRA tool has been used to

Dermal Not applicable. 0.001 The ECETOC TRA dot has been used estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Long term exposure, Systemic, Not applicable. 0.06 The ECETOC TRA tool has been used to

Inhalable

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Not applicable.

Combined

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -

Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.12 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

below this value



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of

preparations containing EA up to 2% - Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649 Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

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

Release fraction to air from wide dispersive use (regional

only):

Not available.

Release fraction to soil from wide dispersive use (regional

Not available.

1.00x10-5

Release fraction to wastewater from wide dispersive use:

Not available.

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit

Not applicable.

discharges, air emissions and releases to soil:

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Treat air emission to provide a typical removal efficiency of

No wastewater treatment required.

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC06d

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to 1.00x10-5

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional Not available

Release fraction to soil from wide dispersive use (regional Not available.

only):

Not available. Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

prevent release:

Technical on-site conditions and measures to reduce or limit

Soil emission controls are not applicable as there is no direct release to soil.

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Continuous release.

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day): Not available

300 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental

exposure:

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2%

Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

37/239

Frequency and duration of use:

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

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

1 00x10-5

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55.1

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

365 Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

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

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not applicable.

Continuous release.

None.

1.00x10-5

1.00x10-4

0.02

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

plant:

1300

5.00x10-3

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available.

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Conditions and measures related to municipal sewage treatment

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 2%

Amounts used: Not applicable. Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics: Solid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

•

Indoor. professional setting

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### **Section 3:: Exposure estimation**

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% - Professional

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -

Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 6.87x10-13 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	EUSES calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
0.010	737	EUSES calculation
Not evaluated.	0	<b>EUSES</b> calculation
0	0.231	<b>EUSES</b> calculation
Not evaluated.	6.94	Not applicable.
Value	Justification	
3.68x10-3	EUSES calculation	
0	EUSES calculation	
Local concentration	PEC aquatic (local+regional)	Justification
2.82x10-6	8.15x10-3	EUSES calculation
3.67x10-6	8.06x10-4	<b>EUSES</b> calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	<b>EUSES</b> calculation
Not evaluated.	0.258	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
	(local exposure estimation) kg/day 0.010 Not evaluated. 0 Not evaluated. Value 3.68x10-3 0  Local concentration 2.82x10-6 3.67x10-6 Not applicable. Local concentration Not evaluated. Not evaluated.	(local exposure estimation) kg/ day  0.010 737  Not evaluated. 0 0 0.231  Not evaluated. 6.94  Value Justification 3.68x10-3 EUSES calculation   Local concentration PEC aquatic (local+regional) 2.82x10-6 8.15x10-3 3.67x10-6 8.06x10-4  Not applicable. Not applicable.  Local concentration PEC sediment (local+regional) Not evaluated. 0.258

Pentaethylenehexamine, PEHA

**Identified use name:** Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Agricultural soil averaged mg/kg 1.15x10-12 3.75x10-4 **EUSES** calculation dwt Grassland averaged mg/kg dwt 2.25x10-12 3.75x10-4 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated. 5.91x10-6 Local concentration PEC air (local+regional) Justification During emission mg/m<sup>3</sup> 1.95x10-14 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1.95x10-14 7.07x10-13 **EUSES** calculation Annual deposition mg/m<sup>2</sup>/d 9.90x10-14 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2 Workers - Exposure estimation

Route of exposure

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

**Dose/Concentration** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.0003

estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Long term exposure, Systemic, Not applicable. 0.02 The ECETOC TRA tool has been used to

estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Long term exposure, Systemic, Not applicable Not applicable. Not applicable.

Combined

**Contributing scenarios** 

Not applicable. Not applicable. Long term exposure, Local, Dermal Not applicable.

Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL Inhalable has been derived.

Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable

**Dermal** acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable.

Combined acute effects and therefore, no acute DNEL

has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable.

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Not applicable. 0.03 The ECETOC TRA tool has been used to

Inhalable estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

**Justification** 

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Route of exposure Contributing scenarios Dose/Concentration** Justification

The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable 0.0003

**Dermal** estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Long term exposure, Systemic, 0.02 The ECETOC TRA tool has been used to Not applicable

Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable.

Combined Not applicable. Long term exposure, Local, Dermal Not applicable Not applicable.

Identified use name: Handling of solid products with small amounts of Pentaethylenehexamine, PEHA unbound ethylenamines - Use of preparations containing EA up to 2% -Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.03 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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.



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of

preparations containing EA up to 100% - Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09,

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: ERC01, ERC02, ERC06a

Not available.

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

Section	on 2.1	: 0	Contro	o lo	f env	ironmen	ta	exposure
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Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3 72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental Indoor. industrial setting

exposure:

Release fraction to air from process (initial release prior to 1x10-5

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional Not available.

only):

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

Not available. Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

Not available.

=>27.7

1.61x10-8

Not available.

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

wastewater

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100%

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Conditions and measures related to municipal sewage treatment plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3.72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

365 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

Assumed on-site sewage treatment plant flow (m³/d):

Continuous release.

Indoor, industrial setting

1x10-5

1x10-4

1.61x10-8

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27 7

2000

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 3720 20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 744 2000 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

Substance supplied to that use in form of: As such Sector of end use: SU03 Subsequent service life relevant for that use: No.

46/239

Environmental Release Category: ERC01, ERC02, ERC06a

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000

Indoor. industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional Not available.

only):

Not available. Release fraction to wastewater from wide dispersive use: Not applicable.

Technical conditions and measures at process level (source) to prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

365

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 3720 20% Fraction of Regional tonnage used locally: 744 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2038

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Continuous release.

Indoor, industrial setting

1.1x10-3

5.0x10-5

Not available.

Not available

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

2000 Assumed on-site sewage treatment plant flow (m³/d):

Section 2.2: Control of worker exposure

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

**Product characteristics:** Liquid. Covers percentage substance in the product up to 100%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

Personal protection:

dispersion and exposure:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Prevent discharge of undissolved substance to or recover from onsite

management supervision controls.

Not applicable.

=>27.7

Not available

wastewater

Section 2.2: Control of worker exposure

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

**Product characteristics:** Liquid. Covers percentage substance in the product up to 100%

Amounts used: Not applicable.

Frequency and duration of use: Avoid carrying out operation for more than 4 hours.

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

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

**Product characteristics:** Liquid. Covers percentage substance in the product up to 100%

Amounts used:

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Not applicable.

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05,

PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

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

**Personal protection:** 

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a minimum efficacy of 90%

#### 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

**Product characteristics:** 

Liquid. Covers percentage substance in the product up to 100%

Amounts used:

Not applicable.

Frequency and duration of use:

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

Human factors not influenced by risk management: Other given operational conditions affecting workers Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Technical conditions and measures at process level (source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

Not applicable.

**Personal protection:** 

dispersion and exposure:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a minimum efficacy of 90%

#### 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)

Liquid. Covers percentage substance in the product up to 100%

**Product characteristics:** Amounts used:

Not applicable.

Frequency and duration of use:

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

Human factors not influenced by risk management:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers exposure:

Indoor, industrial setting

Not applicable.

Technical conditions and measures at process level (source) to prevent release:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Technical conditions and measures to control dispersion from source towards the worker:

removal efficiency of (%): 90%

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

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection, with a minimum efficacy of 90%

# Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

Liquid. Covers percentage substance in the product up to 100%

**Product characteristics:** 

Amounts used:

Not applicable.

Frequency and duration of use:

Avoid carrying out operation for more than 1 hour.

Human factors not influenced by risk management:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers exposure:

Indoor, industrial setting

Technical conditions and measures at process level (source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical removal efficiency of (%): 90%

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

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a minimum efficacy of 95%

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities

**Product characteristics:** 

Amounts used: Frequency and duration of use:

Human factors not influenced by risk management: Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers percentage substance in the product up to 100%

Not applicable.

Avoid carrying out operation for more than 4 hours.

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

**Amounts used:** 

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers percentage substance in the product up to 100%

Not applicable.

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

Liquid. Covers percentage substance in the product up to 100%

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

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

Indoor, industrial setting

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 8: Use as laboratory reagent

**Product characteristics:** 

Amounts used:

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Not applicable.

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Default breathing volume Light work: 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Section 3:.1 Environment - Exposure estimation
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Contributing scenario controlling environmental exposure for 0: Manufacture of substances

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	EUSES calculation
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1064x10-4	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	5.9x10-8	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0.020	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	EUSES calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.102	737	EUSES calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0.0204	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.037	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-5	8.17x10-3	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05,

PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Marine water mg/l	3.76x10-5	8.39x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.268	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling wo		closed process, no likelihood of	exposure
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.1	0.007	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.1	0.06	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	1.1	0.12	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given by the process of the proce

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, Not applicable. 0.14

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

exposure estimates for other PROC are

highest exposure level is given since the exposure estimates for other PROC are

below this value

below this value

Pentaethylenehexamine, PEHA

**Dermal** 

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo		losed batch process (synthesis	or formulation)
Short term exposure, Local, Inhalable	Not applicable.	0.55	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	0.548	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.14	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.30	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.62	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15

PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Section 3:.2 Workers - Exposure est			
	orker exposure for 3: Use in b	patch and other process (synthe	esis) where opportunity for exposure arises
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.3	0.14	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.3	0.30	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	1.3	0.62	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
	orker 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	1.4	0.27	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.4	0.30	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

(inuitistage and/or significant conta	ci)		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.4	0.27	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.4	0.30	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL
Short term exposure, Local, Inhalable	1.4	0.60	has been derived.  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo containers at non-dedicated facilities	orker exposure for 5: Transfe	r of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.5	0.27	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.5	0.37	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal Long term exposure, Local, Inhalable	Not applicable. Not applicable	Not applicable. Not applicable.	Not applicable.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	1.5	0.74	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo containers at dedicated facilities		r of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.2	0.14	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.2	0.548	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% -

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a

Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	1.2	0.55	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

including weighing)			
Route of exposure	Contributing scenarios	Dose/Concentration	Justification

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	1.3	0.14	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	1.3	0.30	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	1.3	0.62	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 8: Use as laboratory reagent Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.14 estimate workplace exposures unless Dermal otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.30 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Since the substance is not classified for Not applicable Not applicable. Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, 0.62 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 100% - Industrial

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, 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: ERC01, ERC02, ERC06a



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of

preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09

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, ERC02, ERC06a

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

Section	21.	Control of	environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3 72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Indoor. industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: Technical on-site conditions and measures to reduce or limit

Pentaethylenehexamine, PEHA

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

to provide the required removal efficiency of 3 (%):

Conditions and measures related to municipal sewage treatment

=>27.7

Soil emission controls are not applicable as there is no direct release to soil.

Not available

1x10-5

1x10-4

1.61x10-8

Not available.

Not available

Not available.

Not applicable.

No air emission controls required; required removal efficiency is 0%.

Prevent discharge of undissolved substance to or recover from onsite wastewater

> Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year):

Fraction of Regional tonnage used locally:

Annual site tonnage (tonnes/year):

Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day):

Not available.

Frequency and duration of use:

Not available.

Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Local marine water dilution factor: 1000

Other given operational conditions affecting environmental Indoor. industrial setting

1x10-5

1.61x10-8

Not available.

Not available.

Not available.

Not applicable.

=>27.7

Not available

wastewater.

exposure:

Release fraction to air from process (initial release prior to

KIVI IVI):

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):
Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of <sup>3</sup> (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year):

3720

Fraction of Regional tonnage used locally: 20%
Annual site tonnage (tonnes/year): 744
Average Local Daily Tonnage (kg/day): 2000

Maximum daily site tonnage (kg/day):

Frequency and duration of use:

Continuous release.

Emission Days (days/year): 365

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Prevent discharge of undissolved substance to or recover from onsite

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Indoor. industrial setting

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Operational conditions: Indoor use.

Product characteristics:

Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 3720 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 744 2038 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Continuous release. Frequency and duration of use:

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Indoor, industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to 1.1x10-3

RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

5.0x10-5

Not available.

Not available

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

=>27.7

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

Not applicable.

Not applicable.

from source towards the worker:

Organisational measures to prevent/limit releases,

Not applicable.

dispersion and exposure:

Personal protection:

**Product characteristics:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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

Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large

Not applicable.

containers at dedicated facilities Product characteristics:

Liquid. Covers concentrations up to 2%

Amounts used:
Frequency and duration of use:

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

Human factors not influenced by risk management:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor.

exposure:

Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used:

Not applicable.

Frequency and duration of use:

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

Human factors not influenced by risk management:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

Not applicable.

from source towards the worker: Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

**Justification** 

management supervision controls.

Total release for regional

exposure estimation kg/day

#### Section 3:: Exposure estimation

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Release from point source

(local exposure estimation) kg/

Waste water	<b>day</b> 1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	5.9x10-8	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x105	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	EUSES calculation
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Release from point source

	(local exposure estimation) kg/day	exposure estimation kg/day	
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.020	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

**Justification** 

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

PEC air (local+regional) **Justification Local concentration** During emission mg/m<sup>3</sup> 5.67x10-6 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 5.67x10-6 5.67x10-6 **EUSES** calculation Not evaluated. Annual deposition mg/m²/d 2.87x10-5 **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Release from point source

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Total release for regional

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	<b>day</b> 0.102	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.0204	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.037	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-5	8.17x10-3	EUSES calculation
Marine water mg/l	3.76x10-5	8.39x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.268	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	EUSES calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

(multistage and/or significant contact	ct)		
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	2.1	0.005	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	2.1	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal		Not applicable.	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Justification

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09
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, ERC02, ERC06a

Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, 1.22 2.1 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: 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, The ECETOC TRA tool has been used to 22 0.005 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.31 The ECETOC TRA tool has been used to Long term exposure, Systemic, 22 estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 2.2 0.61

Short term exposure, Local, Inhalable

The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

**Dose/Concentration** 

Route of exposure Long term exposure, Systemic, Dermal

**Contributing scenarios** 

Not applicable.

0.005

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est	imation		
Contributing scenario controlling we including weighing)		substance or preparation into sm	all containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.005	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

**Identified use name:** Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Process Category: PROC05, PROC08a, PROC08b, PROC09
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, ERC02, ERC06a

#### 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.



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of

preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09

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, ERC02, ERC06a

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

Contina	24.	Control	of environmental exposure	_
Section	2.1	Control	or environmental exposure	æ

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3 72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Pentaethylenehexamine, PEHA

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

365

Indoor. industrial setting

1x10-5

1x10-4

1.61x10-8

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 3.72x10-3 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental Indoor, industrial setting

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Not available.

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow (m³/d):

Not available

=>27.7

1x10-5

1.61x10-8

Not available.

Not available.

Not applicable.

Prevent discharge of undissolved substance to or recover from onsite

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

wastewater.

Not available

2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 3720 20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 744

2000 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 365

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

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

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

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to prevent release:

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 (%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment Indoor. industrial setting

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products) Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year):

Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 744 2038 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Continuous release. Frequency and duration of use:

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Indoor, industrial setting Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

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

Release fraction to air from wide dispersive use (regional

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

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Not applicable.

3720

1.1x10-3

5.0x10-5

Not available

Not available

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

=>27.7

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers Indoor. industrial setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities **Product characteristics:** 

Liquid. Covers concentrations up to 0.5%

**Amounts used:** Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used:

Not applicable.

Frequency and duration of use:

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

Human factors not influenced by risk management: Other given operational conditions affecting workers Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

exposure:

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

Not applicable.

from source towards the worker:

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

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

**Justification** 

management supervision controls.

Total release for regional

exposure estimation kg/day

#### Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Release from point source

(local exposure estimation) kg/

Waste water	<b>day</b> 1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	5.9x10-8	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09

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, ERC02, ERC06a

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	EUSES calculation
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	<b>day</b> 0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.020	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% - Industrial

**Justification** 

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

PEC air (local+regional) **Justification Local concentration** During emission mg/m<sup>3</sup> 5.67x10-6 Not evaluated. **EUSES** calculation Annual average mg/m³ 5.67x10-6 5.67x10-6 **EUSES** calculation Annual deposition mg/m²/d 2.87x10-5 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.102	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.0204	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.037	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-5	8.17x10-3	EUSES calculation
Marine water mg/l	3.76x10-5	8.39x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.268	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	EUSES calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

(multistage and/or significant contac	•	D 10	Local Constitution
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal		Not applicable.	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industria

Process Category: PROC05, PROC08a, PROC08b, PROC09
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, ERC02, ERC06a

Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: 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, The ECETOC TRA tool has been used to 3 1 0.001 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.76 The ECETOC TRA tool has been used to Long term exposure, Systemic, 3.1 estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived.

Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

1.52 The ECETOC TRA tool has been used to Short term exposure, Local, 3.1 Inhalable

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

Route of exposure **Contributing scenarios Dose/Concentration** Justification

Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.001 Dermal

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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, ERC02, ERC06a

Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 2: 2 Workers Exposure set	imetion		
Section 3:.2 Workers - Exposure est Contributing scenario controlling we including weighing)		f substance or preparation into sn	nall containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

**Identified use name:** Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09
Substance supplied to that use in form of: As such Sector of end use: SU03

### 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09
Substance supplied to that use in form of: As such

Sector of end use: SU03



### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of

preparations containing EA up to 2% - Professional

Process Category: PROC08a

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: ERC01, ERC02, ERC06a

1x10-5

1x10-4

1.61x10-8

Not available.

Not available

Not available.

Not available

### 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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3 72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Indoor. industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Prevent discharge of undissolved substance to or recover from onsite wastewater

> Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

79/239

Pentaethylenehexamine, PEHA

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1 86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 3.72x10-3 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental Indoor, industrial setting

exposure:

Release fraction to air from process (initial release prior to 1x10-5

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release 1.61x10-8

prior to RMM):

Release fraction to air from wide dispersive use (regional Not available.

Not available.

Not applicable.

=>27.7

Not available

wastewater.

only):

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use: Not available.

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 3720 20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 744 2000 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 365

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Prevent discharge of undissolved substance to or recover from onsite

Professional

Process Category: PROC08a Substance supplied to that use in form of: As such

Sector of end use: SU22

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Indoor. industrial setting

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Operational conditions: Indoor use. Product characteristics:

Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 3720 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 744 2038 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Continuous release. Frequency and duration of use:

Emission Days (days/year): 225

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Indoor, industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

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

1.1x10-3

5.0x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -Professional

Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Not available.

=>27.7

Prevent discharge of undissolved substance to or recover from onsite

No air emission controls required; required removal efficiency is 0%.

wastewater.

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow (m³/d): 2000

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

**Justification** 

management supervision controls.

Total release for regional

PEC air (local+regional)

Not evaluated.

exposure estimation kg/day

#### Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Release from point source

**Local concentration** 

2.83x10-5

(local exposure estimation) kg/

	uay		
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	5.9x10-8	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05X10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation

Pentaethylenehexamine, PEHA

During emission mg/m<sup>3</sup>

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

**Justification** 

**EUSES** calculation

Professional

Process Category: PROC08a

Substance supplied to that use in form of: As such Sector of end use: SU22

Annual average mg/m³ 2.83x10-5 2.83x10-5 EUSES calculation
Annual deposition mg/m²/d 1.44x10-4 Not evaluated. EUSES calculation

Local concentration PEC aquatic (local+regional) Justification

Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x0-3	EUSES calculation
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05X10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
0	737	EUSES calculation
Not evaluated.	0	<b>EUSES</b> calculation
0.020	0.231	EUSES calculation
Not evaluated.	6.94	EUSES calculation
Value	Justification	
Not applicable as there is no release to wastewater.	EUSES calculation	
Not applicable as there is no release to wastewater.	EUSES calculation	
Local concentration	PEC aquatic (local+regional)	Justification
0	8.15x10-3	EUSES calculation
0	8.02x10-4	<b>EUSES</b> calculation
Not applicable	Not applicable	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.256	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
	(local exposure estimation) kg/day 0 Not evaluated. 0.020 Not evaluated.  Value Not applicable as there is no release to wastewater. Not applicable as there is no release to wastewater.  Local concentration 0 Not applicable Local concentration Not evaluated. Not evaluated.	(local exposure estimation) kg/day day  0 737  Not evaluated. 0 0.020 0.231  Not evaluated. 6.94  Value Justification  Not applicable as there is no release to wastewater.  Not applicable as there is no release to wastewater.  Local concentration PEC aquatic (local+regional) 0 8.15x10-3 0 8.02x10-4  Not applicable Not applicable  Local concentration PEC sediment (local+regional) Not evaluated. 2.61  Not evaluated. 0.256

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Release from point source

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Total release for regional

**Justification** 

(local exposure estimation) kg/	exposure estimation kg/day	
0.102	737	EUSES calculation
Not evaluated.	0	EUSES calculation
0.0204	0.231	EUSES calculation
Not evaluated.	6.94	EUSES calculation
Value	Justification	
0.037	EUSES calculation	
0	EUSES calculation	
Local concentration	PEC aquatic (local+regional)	Justification
2.82x10-5	8.17x10-3	<b>EUSES</b> calculation
3.76x10-5	8.39x10-4	<b>EUSES</b> calculation
Not applicable	Not applicable	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.268	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
3.35x10-4	7.10x10-4	EUSES calculation
6.52x10-4	1.03x10-3	EUSES calculation
Not evaluated.	1.13x10-5	EUSES calculation
Local concentration	PEC air (local+regional)	Justification
5.67x10-6	Not evaluated.	EUSES calculation
5.67x10-6	5.67x10-6	EUSES calculation
2.87x10-5	Not evaluated.	EUSES calculation
Local concentration  Not applicable.	PEC aquatic (local+regional)  Not applicable.	Justification Not applicable.
	day 0.102 Not evaluated. 0.0204 Not evaluated. Value 0.037  0  Local concentration 2.82x10-5 3.76x10-5 Not applicable Local concentration Not evaluated. Not evaluated. Local concentration 3.35x10-4  6.52x10-4 Not evaluated. Local concentration 5.67x10-6 5.67x10-6 2.87x10-5 Local concentration	day         0.102         737           Not evaluated.         0         0.231           Not evaluated.         6.94           Value         Justification           0.037         EUSES calculation           Local concentration         PEC aquatic (local+regional)           2.82x10-5         8.17x10-3           3.76x10-5         8.39x10-4           Not applicable         Not applicable           Local concentration         PEC sediment (local+regional)           Not evaluated.         2.61           Not evaluated.         0.268           Local concentration         PEC soil (local+regional)           3.35x10-4         1.03x10-3           Not evaluated.         1.13x10-5           Local concentration         PEC air (local+regional)           5.67x10-6         Not evaluated.           5.67x10-6         5.67x10-6           2.87x10-5         Not evaluated.           Local concentration         PEC aquatic (local+regional)

# Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: 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	2.2	0.005	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	2.2	0.31	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 2% -

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Not applicable Long term exposure, Local, Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, 2.2 0.61 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of

preparations containing EA up to 0.5% - Professional

Process Category: PROC08a

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: ERC01, ERC02, ERC06a

### 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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1.86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 Annual site tonnage (tonnes/year): 3 72x10-3 Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Indoor. industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

=>27.7

1x10-5

1.61x10-8

Not available.

Not available

Not available.

Not applicable.

Not available

Prevent discharge of undissolved substance to or recover from onsite

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

wastewater

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

> Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1 86x10-4 Fraction of Regional tonnage used locally: 3.72x10-3 3.72x10-3 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10192 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental Indoor, industrial setting

exposure:

Release fraction to air from process (initial release prior to 1x10-5

Release fraction to soil from process (initial release prior to 1x10-4

RMM):

Release fraction to wastewater from process (initial release 1.61x10-8

prior to RMM):

Release fraction to air from wide dispersive use (regional Not available.

only):

Release fraction to soil from wide dispersive use (regional Not available.

only):

Release fraction to wastewater from wide dispersive use: Not available. Not applicable.

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil.

=>27.7

Not available

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

wastewater. Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 3720

20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 744 2000 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 365

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

No air emission controls required; required removal efficiency is 0%.

Prevent discharge of undissolved substance to or recover from onsite

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Indoor. industrial setting

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Operational conditions: Indoor use.

Product characteristics:

Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 744 2038 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

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

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

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Not available.

3720

Continuous release.

225

1300

Indoor, industrial setting

1.1x10-3

5.0x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

> Professional Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

=>27.7

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

### Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0.102	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp)	5.93x10-5	EUSES calculation	

mg/l

Concentration in sewage sludge

mg/kg dwt

**EUSES** calculation

**Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 5 9x10-8 8 15x10-3 **EUSES** calculation 8.02x10-4 **EUSES** calculation Marine water mg/l 5 9x10-8 Intermittent release. mg/l Not applicable Not applicable Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. 2.61 EUSES calculation Not evaluated 0.256 **FUSES** calculation Marine water sediment mg/kg dwt PEC soil (local+regional) Local concentration **Justification** 

Agricultural soil averaged mg/kg

dwt

Grassland averaged mg/kg dwt

Groundwater mg/l

During emission mg/m<sup>3</sup>

3.26x10-3 Not evaluated **Local concentration** 

1.67x10-3

2.05x10-3 3.64x10-3 3 28x10-5

**EUSES** calculation **EUSES** calculation **EUSES** calculation

**EUSES** calculation

**Justification** 

PEC air (local+regional) 2.83x10-5 Not evaluated.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Annual average mg/m³ 2.83x10-5 2.83x10-5 EUSES calculation
Annual deposition mg/m²/d 1.44x10-4 Not evaluated. EUSES calculation

Local concentration PEC aquatic (local+regional) Justification

Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an intermediate

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	1.64x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	5.93x10-5	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	5.9x10-8	8.15x10-3	EUSES calculation
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05x10-3	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Formulation of preparations\*

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0.020	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Pentaethylenehevamine PEHA		Identified use name: Use of	f ethylenamines in close

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Release from point source

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Manufacture of coatings, adhesives and inks (and powder products)

Total release for regional

**Justification** 

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.102	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.0204	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.037	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-5	8.17x10-3	EUSES calculation
Marine water mg/l	3.76x10-5	8.39x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.268	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.35x10-4	7.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	6.52x10-4	1.03x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.13x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.67x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	5.67x10-6	5.67x10-6	EUSES calculation
Annual deposition mg/m²/d	2.87x10-5	Not evaluated.	EUSES calculation
Micro-organism mg/l	Local concentration Not applicable.	PEC aquatic (local+regional)  Not applicable.	Justification Not applicable.

# Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: 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.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in closed system with little opportunity for exposure - Use of preparations containing EA up to 0.5% -

Professional Process Category: PROC08a

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: ERC01, ERC02, ERC06a

Not applicable Long term exposure, Local, Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Section 2.1:	Control of	environmental	exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Not available

4840

Not available.

365

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

> 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

plant:

1240

1.00x10-5

Not available.

Not available.

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860

Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

> 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

only):

prevent release:

Release fraction to soil from wide dispersive use (regional

only):

Technical conditions and measures at process level (source) to

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

300

1.00x10-5

Not available.

Not available.

Not available

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Lube oil use

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% 260 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1182

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

1300

Not available

220

1000

None

1.00x10-5

1.00x10-3

1.00x10-3

Not available.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Technical conditions and measures at process level (source) to prevent release:

Release fraction to wastewater from wide dispersive use:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55 1

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

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

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

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

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

100

Not available.

1300

1.00x10-5

1 00x10-4

0.02

Not available.

Not available.

Not available

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

Not available.

None.

1x10-5

0

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.2: Control of worker exposure Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** 

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Liquid. Covers concentrations up to 15%

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Industrial Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

#### **Personal protection:**

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Default breathing volume Light work: 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Indoor, industrial setting

Not applicable.

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

dispersion and exposure:

Personal protection:

Organisational measures to prevent/limit releases,

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

removal efficiency of (%): 90%

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg Indoor, industrial setting

Not applicable.

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level (source) to prevent release:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

removal efficiency of (%): 90%

### 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

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 1-4 hour(s)

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg Human factors not influenced by risk management:

Other given operational conditions affecting workers

Indoor, industrial setting

Technical conditions and measures at process level (source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management: Other given operational conditions affecting workers

Amounts used:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 15%

Not applicable.

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

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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)

Amounts used:

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 15%

Not applicable.

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

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 1-4 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Indoor, industrial setting

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Production of preparations\* or articles by tabletting, compression, extrusion,

pelletisation

**Product characteristics:** 

Amounts used:

Frequency and duration of use:

Human factors not influenced by risk management: Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 15%

Not applicable.

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

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### **Section 3:: Exposure estimation**

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

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: ERC01, ERC02, ERC04, ERC05,

ERC08d, ERC08e, ERC08f, ERC11a

Section 3:.1	Environment -	Exposure es	timation
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Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.9x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	oustineation
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

**Justification** 

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	8.49x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	8.49x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.07x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.35x10-7	8.15x10-3	EUSES calculation
Marine water mg/l	3.05x10-7	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.257	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.40x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.64x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.36x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.21x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.022	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

**Justification** 

Total release for regional

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.012	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-4	5.42x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-4	7.01x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	8.61x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.45x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-6	2.83x10-6	EUSES calculation
Annual deposition mg/m²/d	1.44x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

(multistage and/or significant contac	<b>31)</b>		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ering operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Industrial **Process Category:** PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, 0.914 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: Industrial spraying Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.1286 estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.457 The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to 0.914 Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.0411 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.457 Inhalable estimate workplace exposures unless 0.548 otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, nhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.914 1.097	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est			
Contributing scenario controlling wo containers at dedicated facilities	orker exposure for 4: Transfe	er of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless

Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL

			nas been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 3:.2 Workers - Exposure est	imation	عامد المالية	
Contributing scenario controlling wo including weighing)	orker exposure for 5: Transfe	r of substance or preparation in	nto small containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ent of articles by dipping and po	puring
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0411	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0411	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.548	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined

has been derived.

Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

1.097

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 7: Production of preparations\* or articles by tabletting, compression, extrusion, pelletisation

Route of exposure **Contributing scenarios Dose/Concentration** Long term exposure, Systemic, Not applicable. 0.0822 Dermal

**Justification** The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.457

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

exposure estimates for other PROC are below this value

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal

Long term exposure, Local, Inhalable

Not applicable. Not applicable

Not applicable.

Not applicable.

Not applicable. Not applicable. Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local,

Inhalable

Not applicable.

0.914

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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

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

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

> 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13,

PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840

20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to 1.00x10-5

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

only):

Release fraction to air from wide dispersive use (regional Not available

Release fraction to soil from wide dispersive use (regional

only):

Not available.

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not available. Not applicable.

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

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure: Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

1860

1300

1 00x10-5

Not available.

Not available

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day):

Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1 00x10-5

Not available

Not available.

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Lube oil use

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region:

1300 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 260 Average Local Daily Tonnage (kg/day): 1182 Maximum daily site tonnage (kg/day):

Not available. Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

1.00x10-3

1.00x10-5

1.00x10-3

Release fraction to air from wide dispersive use (regional

only):

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 111/239

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

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available. Not available

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 20% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 20.1 55 1 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

100

Not available

365

1300

1.00x10-5

1.00x10-4

0.02

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to 1x10-5

RMM):

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available. Release fraction to wastewater from wide dispersive use: Not applicable.

Technical conditions and measures at process level (source) to prevent release:

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

Not available.

Not available.

Not available

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

> training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a

Use the following local exhaust ventilation types: Treat air emission to provide a typical

minimum efficacy of 90%

removal efficiency of (%): 90%

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

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Covers daily exposures up to 8 hours (unless stated differently). Frequency and duration of use:

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

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

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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)

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Treatment of articles by dipping and pouring

**Product characteristics:** 

Amounts used:

Liquid. Covers concentrations up to 2%

Frequency and duration of use:

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

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Not applicable.

Indoor, industrial setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 8: Production of preparations\* or articles by tabletting, compression, extrusion,

pelletisation

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor, industrial setting

Not applicable.

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

**Local concentration** Justification PEC soil (local+regional) Agricultural soil averaged mg/kg **EUSES** calculation 3.75x10-4 Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. 5.91x10-6 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ n 0 6.87x10-13 Annual average mg/m³ **EUSES** calculation 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Total release for regional

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	8.49x10-4	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	8.49x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.07x10-4	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

Justification

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 118/239

Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.35x10-7	8.15x10-3	EUSES calculation
Marine water mg/l	3.05x10-7	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.257	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.40x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.64x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.914x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.36x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.21x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	EUSES calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 119/239

Section 3:.1	Environment	- Exposure	estimation
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Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.012	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-4	5.42x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-4	7.01x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	8.61x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.45x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-6	2.83x10-6	EUSES calculation
Annual deposition mg/m²/d	1.44x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

, ,	,			
Route of exposure	Cont	tributing scenarios	Dose/Concentration	Justification
Long torm expecting Cu	rotomio Nata	and the state	2.05	The ECETOC TRA tool

Long term exposure, Systemic,

**Dermal** 

Not applicable.

0.05

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.61

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Combined

Not applicable.

Long term exposure, Local, Dermal Long term exposure, Local, Inhalable

Not applicable. Not applicable

Not applicable. Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived 1.22 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Calendering operations **Route of exposure Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.05 Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to 1.22 Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: Industrial spraying **Route of exposure Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.09 Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Pentaethylenehexamine, PEHA Identified use name: Use of ethylenamines in open processes with high

exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 121/239

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 **Contributing scenarios Dose/Concentration Justification** Route of exposure Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable.

Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable

has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for

**Dermal** acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable

Inhalable acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined

has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived. Not applicable. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable.

Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 122/239

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Route of exposure	•		The ECETOC TRA tool has been used to
Long term exposure, Systemic, Dermal	Not applicable.	0.05 0.09	estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est		r of substance or preparation in	to small containers (dedicated filling line,
Contributing scenario controlling wo including weighing) Route of exposure		Dose/Concentration	Justification
including weighing) Route of exposure Long term exposure, Systemic,	Contributing scenarios Not applicable.	Dose/Concentration 0.05	Justification  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
including weighing)	Contributing scenarios		The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
including weighing) Route of exposure Long term exposure, Systemic, Dermal  Long term exposure, Systemic, Inhalable  Long term exposure, Systemic,	Contributing scenarios Not applicable.	0.05	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
including weighing) Route of exposure Long term exposure, Systemic, Dermal  Long term exposure, Systemic, Inhalable  Long term exposure, Systemic, Combined	Contributing scenarios Not applicable.  Not applicable.	0.05	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
including weighing) Route of exposure Long term exposure, Systemic, Dermal  Long term exposure, Systemic, Inhalable  Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local,	Contributing scenarios Not applicable.  Not applicable.	0.05  0.61  Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  Not applicable.  Not applicable.  Since the substance is not classified for
including weighing) Route of exposure Long term exposure, Systemic, Dermal  Long term exposure, Systemic,	Contributing scenarios Not applicable.  Not applicable.  Not applicable.  Not applicable.	0.05  0.61  Not applicable.  Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value  Not applicable.  Not applicable.  Since the substance is not classified for acute effects and therefore, no acute DNE

Section 3:.2 Workers - Exposure estimation

**Identified use name:** Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 6: Roller application or brushing **Contributing scenarios Justification** Route of exposure **Dose/Concentration** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.09**Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 7: Treatment of articles by dipping and pouring Route of exposure **Dose/Concentration Justification Contributing scenarios** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Pentaethylenehexamine, PEHA Identified use name: Use of ethylenamines in open processes with high

exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 8: Production of preparations\* or articles by tabletting, compression, extrusion, pelletisation

pelletisation **Contributing scenarios Dose/Concentration Justification** Route of exposure Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Not applicable. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable.

Pentaethylenehexamine, PEHA

Inhalable

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

below this value

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Sector of end use: SU03

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 125/239

Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available Route of exposure **Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. estimate workplace exposures unless Dermal otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

### 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

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

exposure estimates for other PROC are

below this value

Sector of end use: SU03

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 126/239



Industrial

#### Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

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

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10. PROC13. PROC14

> Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year):

Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

plant:

Not applicable.

1860

Not available.

300

1.00x10-5

Not available.

Not available.

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

# Section 2.1: Control of environmental exposure

Maximum daily site tonnage (kg/day):

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

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

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Frequency and duration of use: Continuous release. 300

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Not available

Technical conditions and measures at process level (source) to prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1300

1.00x10-5

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Lube oil use

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% 260 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1182

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

Emission Days (days/year): 220

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available.

1300

Continuous release.

None

1.00x10-5

1.00x10-3

1.00x10-3

Not available.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Technical conditions and measures at process level (source) to prevent release:

Release fraction to wastewater from wide dispersive use:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55 1

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

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

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

100

Not available.

365

1300

None

1.00x10-5

1 00x10-4

0.02

Not available.

Not available.

Not available

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to 1x10-5

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available. Release fraction to wastewater from wide dispersive use: Not applicable.

Technical conditions and measures at process level (source) to

prevent release:

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

Not available

Not available.

Not available

No wastewater treatment required.

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

exposure: Indoor, industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10. PROC13. PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

exposure: Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable. Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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 dedicated facilities

**Product characteristics:** 

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 0.5%

Indoor, industrial setting

Indoor, industrial setting and professional setting

Indoor. professional setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used:

Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Indoor. industrial setting

Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

Indoor, industrial setting and professional setting exposure:

Indoor. professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

Not applicable.

Not applicable.

dispersion and exposure:

**Personal protection:** 

Amounts used:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers Indoor. industrial setting

Indoor, industrial setting and professional setting exposure:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10. PROC13. PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Production of preparations\* or articles by tabletting, compression, extrusion,

pelletisation

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Indoor, industrial setting Other given operational conditions affecting workers

exposure: Indoor. industrial setting and professional setting Indoor, professional setting

Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

## Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Waste water 0 Surface water Not evaluated. air (direct + STP) 0.027 Soil (direct releases only) Not evaluated.  Concentration in sewage (PECstp) Not applicable release to wast Concentration in sewage sludge mg/kg dwt Not applicable release to wast Local concentration in sewage sludge mg/kg dwt O	ewater. calculation as there is no EUSES calculation	E E N On culation EUSES	EUSES calculation EUSES calculation EUSES calculation Not applicable.
air (direct + STP)  Soil (direct releases only)  Concentration in sewage (PECstp) mg/l  Concentration in sewage sludge mg/kg dwt  Ocolorium  Oc	0.231 6.94  Justificatio as there is no ewater. calculation as there is no EUSES calculation as there is no EUSES calculation	en Pon Culation EUSES	EUSES calculation
Soil (direct releases only)  Not evaluated.  Value  Concentration in sewage (PECstp) mg/l  Concentration in sewage sludge mg/kg dwt  Not applicable release to wast Local concentration	6.94  Justificatio as there is no ewater. as there is no EUSES calculation as there is no EUSES calculation	on culation EUSES	
Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Not applicable release to wast Local concentration value Not applicable release to wast	Justificatio as there is no ewater. as there is no EUSES calculation as there is no EUSES calculation	on culation EUSES	Not applicable.
Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Not applicable release to wast Local concentration	as there is no EUSES calculation as there is no EUSES calculation	culation EUSES	
mg/I release to wast  Concentration in sewage sludge mg/kg dwt release to wast  Local concentration in sewage sludge  Local concentration in sewage sludge  Not applicable release to wast	ewater. calculation as there is no EUSES calculation		
mg/kg dwt release to wast  Local concent		culation	
		Culation	
Fresh water mg/l 0	tration PEC aquat	ic (local+regional)	Justification
· · · · · · · · · · · · · · · · · · ·	8.15x10-3	E	EUSES calculation
Marine water mg/l 0	8.02x10-4	E	EUSES calculation
Intermittent release. mg/l Not applicable.	Not applicat	ble. 1	Not applicable.
Local concent	tration PEC sedim	ent (local+regional)	Justification
Fresh water sediment mg/kg dwt Not evaluated.	2.61	E	EUSES calculation
Marine water sediment mg/kg dwt Not evaluated.	0.256	E	EUSES calculation
Local concent	tration PEC soil (le	ocal+regional)	Justification
Agricultural soil averaged mg/kg 4.35x10-4 dwt	8.10x10-4	E	EUSES calculation
Grassland averaged mg/kg dwt 8.48x10-4	1.22x10-3	E	EUSES calculation
Groundwater mg/I Not evaluated.	1.29x10-5	E	EUSES calculation
Local concent	tration PEC air (lo	cal+regional)	Justification
During emission mg/m³ 7.37x10-6	Not evaluate	ed. E	EUSES calculation
Annual average mg/m³ 7.37x10-6	7.37x10-6	E	EUSES calculation
Annual deposition mg/m²/d 3.74x10-5	Not evaluate	ed. E	EUSES calculation
Local concent	tration PEC aquati	ic (local+regional)	Justification
Micro-organism mg/l Not applicable.	Not applicat	ble. 1	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC08d, ERC08e, ERC08f, ERC11a

Section 3:.1	Environment -	Exposure es	timation
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Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Waste water Surface water air (direct + STP)	day 0 Not evaluated. 0 Not evaluated.	737 0	EUSES calculation
air (direct + STP)	0	•	ELIOEO I I - 4'
, ,	*		EUSES calculation
Soil (direct releases only)	Not evaluated	0.231	EUSES calculation
		6.94	Not applicable.
	Value	Justification	
0 \ 17	Not applicable as there is no release to wastewater.	EUSES calculation EUSES calculation	
	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
	day	exposure estimation kg/day	
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

PROC10, PROC13, PROC14

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

Sector of end use: SU03, SU22
Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	8.49x10-4	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	8.49x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.07x10-4	EUSES calculation EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.35x10-7	8.15x10-3	EUSES calculation
Marine water mg/l	3.05x10-7	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.257	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.40x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.64x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.36x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.21x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	1.10x10-5	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

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

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 2.61 0.259	Justification EUSES calculation EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.012	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10-4	5.42x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-4	7.01x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	8.61x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.45x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-6	2.83x10-6	EUSES calculation
Annual deposition mg/m²/d	1.44x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

(multistage and/or significant contac	•		1 100 11
Route of exposure	Contributing scenarios	Dose/Concentration	Justification The ECETOC TRA tool has been used to
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo		al spraying	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial **Process Category:** PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC14

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

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 non-dedicated facilities **Justification** Route of exposure **Contributing scenarios Dose/Concentration** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. Dermal estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Not applicable. Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Long term exposure, Systemic, Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

below this value

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,
PROC10. PROC13. PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

exposure estimates for other PROC are

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable. Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Not applicable. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for

**Dermal** acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for

Combined acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable.

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Not applicable. Not applicable. The ECETOC TRA tool has been used to

Inhalable estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 5: Roller application or brushing **Route of exposure Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. Not applicable. estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, Not applicable. Not applicable. The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring **Route of exposure Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable Not applicable. Dermal estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived.

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Short term exposure, Systemic,

Short term exposure, Systemic,

**Dermal** 

Inhalable

Not applicable

Not applicable

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

has been derived.

has been derived.

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Since the substance is not classified for

Since the substance is not classified for

acute effects and therefore, no acute DNEL

acute effects and therefore, no acute DNEL

Short term exposure, Systemic,

Combined

Not applicable

Not applicable.

Since the substance is not classified for

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Local, Dermal Not applicable

Not applicable.

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 7: Production of preparations\* or articles by tabletting, compression, extrusion, pelletisation

Route of exposure

Long term exposure, Systemic, Dermal

**Contributing scenarios** 

Not applicable.

**Dose/Concentration** 

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

**Justification** 

Long term exposure, Systemic,

Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

Not applicable.

highest exposure level is given since the exposure estimates for other PROC are below this value

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

Not applicable.

Not applicable. Not applicable

Not applicable.

Not applicable. Not applicable.

Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable

Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

Since the substance is not classified for

has been derived

Short term exposure, Systemic, Inhalable

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Dermal Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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

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

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

> Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

# Section 2:: Operational conditions and risk management measures

Section 2.1:	Control of	f environmental	exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

365 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release: 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

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 25% - Professional Process Category: 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local marine water dilution factor: 1000 None.

exposure:

RMM):

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

1860

Maximum daily site tonnage (kg/day): Not available.

300

Local freshwater dilution factor: Other given operational conditions affecting environmental

1.00x10-5 Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to air from wide dispersive use (regional

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 25% - Professional Process Category: 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1 00x10-5

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% 20 1 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

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

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

365

1.00x10-5

1 00x10-4

0.02

Not available.

Not available.

Not available.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

None.

5.00x10-3

0.01

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil. No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

Liquid. Covers concentrations up to 25% **Product characteristics:** 

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable. Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Indoor, professional setting

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:** Liquid. Covers concentrations up to 25%

Amounts used: Not applicable.

Frequency and duration of use: Avoid carrying out operation for more than 15 minutes.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release: Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

# Section 3:: Exposure estimation

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	om point source	Total release for regional	Justification
(local expe	osure estimation) kg/	exposure estimation kg/day	
day			

Waste water n 737 **EUSES** calculation **Surface water** Not evaluated. 0 **EUSES** calculation air (direct + STP) 0.027 0.231 **EUSES** calculation Soil (direct releases only) Not evaluated. 6.94 Not applicable.

Value **Justification** Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater.

Concentration in sewage sludge Not applicable as there is no

mg/kg dwt release to wastewater.

**EUSES** calculation

**Justification** Local concentration PEC aquatic (local+regional) Fresh water mg/l 0 8.15x10-3 **EUSES** calculation EUSES calculation Marine water mg/l 8.02x10-4 Intermittent release, mg/l Not applicable. Not applicable. **FUSES** calculation **Local concentration** PEC sediment (local+regional) Justification

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 25% - Professional Process Category: 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	oustinoution
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 0 8.15x10-3 **EUSES** calculation Marine water mg/l 8.02x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. **EUSES** calculation **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.256 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 3.75x10-4 **EUSES** calculation 3.75x10-4 EUSES calculation Grassland averaged mg/kg dwt Not evaluated. EUSES calculation Groundwater mg/l 5.91x10-6 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 6 87x10-13 **EUSES** calculation Annual deposition mg/m²/d 0 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	EUSES calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: PROC05, PROC08a Substance supplied to that use in form of: In a mixture

ce 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 149/239

Section 3:.1	Environment	- Exposure	estimation
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Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.010	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.68x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	3.67x10-6	8.06x10-4	EUSES calculation
ntermittent release. mg/l	Not applicable.	Not applicable.	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.258	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.15x10-12	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	2.25x10-12	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.95x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	1.95x10-14	7.07x10-13	EUSES calculation
Annual deposition mg/m²/d	9.90x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: 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.	0.0685714	The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.365575 Inhalable estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable.

Combined

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable.

Long term exposure, Local, Not applicable Since the substance is not classified for Not applicable.

Inhalable acute effects and therefore, no acute DNEL

has been derived. Since the substance is not classified for

Short term exposure, Systemic, Not applicable Not applicable. **Dermal** acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable

acute effects and therefore, no acute DNEL

has been derived.

Pentaethylenehexamine, PEHA

**Identified use name:** Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Professional

Process Category: 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

0.73115

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

Long term exposure, Systemic, Dermal

Route of exposure

**Contributing scenarios** Not applicable.

**Dose/Concentration** 0.0685714

**Justification** 

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Not applicable.

0.45697

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

exposure estimates for other PROC are below this value

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

Not applicable. Not applicable. Not applicable

Not applicable. Not applicable. Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Not applicable.

Short term exposure, Systemic,

**Dermal** 

Not applicable

Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for

Short term exposure, Systemic, Combined

Short term exposure, Local,

Inhalable

Not applicable

Not applicable.

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable.

Not applicable.

0.91393

Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 25% - Professional Process Category: 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 15% - Professional

Process Category: PROC08a, PROC10, PROC11 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Not available.

365

None.

1 00x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not applicable.

1860

Not available.

1000

1.00x10-5

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 153/239 Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1 00x10-5

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

1.00x10-5

1 00x10-4

Not available.

Not available.

Not available.

Not applicable.

0.02

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% 20 1 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to prevent release:

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available

Continuous release

1300

None.

5.00x10-3

0.01

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional

Process Category: PROC08a, PROC10, PROC11 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** 

Liquid. Covers concentrations up to 15%

Indoor, professional setting

Amounts used:

Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Personal protection:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

removal efficiency of (%): 90%

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 10%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: **Personal protection:** 

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Release from point source

	(local exposure estimation) kg/day	exposure estimation kg/day	
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation

Total release for regional

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional

**Justification** 

Process Category: PROC08a, PROC10, PROC11
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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 3.75x10-4 **EUSES** calculation Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. 5.91x10-6 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ **EUSES** calculation 0 6.87x10-13 Annual average mg/m<sup>3</sup> 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Total release for regional

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
	day		
Waste water	0.022	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	1.10x10-5	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11 Substance supplied to that use in form of: In a mixture

Justification

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	Not applicable.	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	Not applicable.	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.68x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	3.67x10-6	8.06x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.258	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.15x10-12	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	2.25x10-12	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.95x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	1.95x10-14	7.07x10-3	EUSES calculation
Annual deposition mg/m²/d	9.90x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0411	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.548 0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.097 0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo		nnlication or brushing	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 15% - Professional **Process Category:** PROC08a, PROC10, PROC11 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08f, ERC08f, ERC11a

Short term exposure, Systemic, Combined Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable.

Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived

Short term exposure, Local,

Inhalable

Not applicable.

0.914

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 2: Non industrial spraying

Route of exposure Contributing scenarios Dose/Concentration

Long term exposure, Systemic,

Dermal

Not applicable.

0.214

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Not applicable. 0.1

0.121

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

Not applicable.

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable.

applicable Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Dermal

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Inhalable

Short term exposure, Systemic,

Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Dermal Not applicable. Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local,

Inhalable

Not applicable.

0.243

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional

Process Category: PROC08a, PROC10, PROC11
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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

# Section 2:: Operational conditions and risk management measures

Section 2.1:	Control of	environmental	exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

4840

Not available.

365

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05,

ERC08d, ERC08e, ERC08f, ERC11a

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day):

Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Not available.

Not available.

Continuous release.

300

1.00x10-5

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Conditions and measures related to municipal sewage treatment

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1 00x10-5

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% 20 1 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

100

Not available.

365

1.00x10-5

1 00x10-4

0.02

Not available.

Not available.

Not available.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

Not available

Continuous release

5.00x10-3

0.01

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Amounts used:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 2%

Not applicable.

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

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Indoor, professional setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Avoid carrying out operation for more than 4 hours.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

# Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Release from point source
(local exposure estimation) kg
day

Total release for regional exposure estimation kg/day Justification

Waste water **Surface water** air (direct + STP) Soil (direct releases only)

Not evaluated. 0.027 Not evaluated. 737 0.231 6.94

**EUSES** calculation **EUSES** calculation **EUSES** calculation Not applicable.

Concentration in sewage (PECstp)

Concentration in sewage sludge

mg/kg dwt

Not applicable as there is no release to wastewater.

Not applicable as there is no release to wastewater.

**EUSES** calculation

**Justification** 

**EUSES** calculation

Fresh water mg/l Marine water mg/l

Intermittent release. mg/l

Local concentration 0 0

8 15x10-3 8.02x10-4 Not applicable.

**Justification** EUSES calculation **EUSES** calculation Not applicable.

Fresh water sediment mg/kg dwt

Not applicable. Local concentration Not evaluated.

PEC sediment (local+regional) 2 61

PEC aquatic (local+regional)

**Justification** EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg lwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
uring emission mg/m³	7.37x10-6	Not evaluated.	<b>EUSES</b> calculation
nnual average mg/m³	7.37x10-6	7.37x10-6	<b>EUSES</b> calculation
annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
/licro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0	0.231	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 167/239

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 8.15x10-3 **EUSES** calculation Marine water mg/l 8.02x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.256 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 3.75x10-4 **EUSES** calculation EUSES calculation Grassland averaged mg/kg dwt 3.75x10-4 Not evaluated. EUSES calculation Groundwater mg/l 5.91x10-6 **Local concentration** PEC air (local+regional) Justification During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 6 87x10-13 **EUSES** calculation Annual deposition mg/m²/d 0 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	7.92x10-6	8.10x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	Not applicable.	Not evaluated.	EUSES calculation
Annual average mg/m³	Not applicable.	Not applicable.	EUSES calculation
Annual deposition mg/m²/d	Not applicable.	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

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Process Category: PROC08a, PROC11
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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 168/239

Section 3:.1	Environment	- Exposure	estimation
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Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.010	737	EUSES calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.68x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	3.67x10-6	8.06x10-4	EUSES calculation
ntermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.258	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.15x10-12	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	2.25x10-12	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.95x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	1.95x10-14	7.07x10-13	EUSES calculation
Annual deposition mg/m²/d	9.90x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3:.2 Workers - Exposure estimation

Route of exposure

Long term exposure, Systemic,

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Long term exposure, Systemic,	Not applicable.	Not applicable.	The ECETOC TRA tool has been used to
Dermal		••	estimate workplace exposures unless
			otherwise indicated. The PROC with the
			highest exposure level is given since the

**Dose/Concentration** 

exposure estimates for other PROC are below this value

**Justification** 

The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

Not applicable.

exposure estimates for other PROC are below this value

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined

**Contributing scenarios** 

Not applicable.

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable.

Long term exposure, Local, Not applicable Since the substance is not classified for Not applicable. Inhalable acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable

acute effects and therefore, no acute DNEL

has been derived.

Pentaethylenehexamine, PEHA

**Identified use name:** Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

Since the substance is not classified for acute effects and therefore, no acute DNEL

Short term exposure, Local, Dermal Not applicable

Not applicable.

has been derived.

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**Route of exposure** 

Long term exposure, Systemic, **Dermal** 

**Contributing scenarios** Not applicable.

**Dose/Concentration** 

**Justification** 

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Not applicable.

0.15

0.21

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

Not applicable.

Not applicable.

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived. Since the substance is not classified for

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

acute effects and therefore, no acute DNEL

has been derived. Since the substance is not classified for

Short term exposure, Systemic, Combined

Short term exposure, Local,

Inhalable

Not applicable

Not applicable.

Not applicable.

Not applicable.

0.30

acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for

Short term exposure, Local, Dermal Not applicable

acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

Substance supplied to that use in form of: In a mixture Sector of end use: SU22

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

# Section 2:: Operational conditions and risk management measures

Section	on 2.1	: 0	Contro	ol o	fenv	ironment	ta	exposure
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

365 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

No wastewater treatment required.

Not available.

Organisational measures to prevent/limit release from site:

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available.

300

1.00x10-5

Not available

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% 372 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1 00x10-5

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% 20 1 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not available.

365

1.00x10-5

1 00x10-4

0.02

Not available.

Not available.

Not available.

Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 173/239 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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Soil emission controls are not applicable as there is no direct release to soil. No air emission controls required; required removal efficiency is 0%.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available

None.

5.00x10-3

0.01

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Not applicable.

Indoor, professional setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

**Justification** 

management supervision controls.

### **Section 3:: Exposure estimation**

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Value	Justification	••
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
air (direct + STP)	0.027	0.231	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
Waste water	0	737	EUSES calculation
	(local exposure estimation) kg/ day	exposure estimation kg/day	

Concentration in sewage (PECstp) Not applicable as there is no

Concentration in sewage sludge

mg/kg dwt

Fresh water mg/l

release to wastewater.

Release from point source

Not applicable as there is no release to wastewater.

**EUSES** calculation

Total release for regional

**EUSES** calculation

**Local concentration** PEC aquatic (local+regional) **Justification** 0 8 15x10-3 **FUSES** calculation

Marine water mg/l 0 8.02x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** 

Fresh water sediment mg/kg dwt Not evaluated. 2.61 **EUSES** calculation Not evaluated. 0.256 **EUSES** calculation Marine water sediment mg/kg dwt

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg **EUSES** calculation 4.35x10-4 8.10x10-4 8.48x10-4 Grassland averaged mg/kg dwt 1.22x10-3 **EUSES** calculation Groundwater mg/l Not evaluated. 1.29x10-5 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ 7.37x10-6 Annual average mg/m<sup>3</sup> 7.37x10-6 7.37x10-6 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation 3.74x10-5 **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Justification

Total release for regional

Process Category: PROC08a, PROC11 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Release from point source

	(local exposure estimation) kg/ day	exposure estimation kg/day	Justilication
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.257	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.81x10-7	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.52x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.06x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	3.06x10-9	3.06x10-9	EUSES calculation
Annual deposition mg/m²/d	1.55x10-8	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Process Category: PROC08a, PROC11
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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 177/239

Section 3:.1	Environment	- Exposure	estimation
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Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.010	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
nir (direct + STP)	0	0.231	EUSES calculation
oil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
oncentration in sewage (PECstp) ng/l	3.68x10-3	EUSES calculation	
Concentration in sewage sludge ng/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.82x10-6	8.15x10-3	EUSES calculation
/larine water mg/l	3.67x10-6	8.06x10-4	EUSES calculation
ntermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	<b>EUSES</b> calculation
larine water sediment mg/kg dwt	Not evaluated.	0.259	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg lwt	1.15x10-12	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	2.25x10-12	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
Ouring emission mg/m³	1.95x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	1.95x10-14	7.07x10-13	EUSES calculation
nnual deposition mg/m²/d	9.90x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: 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.

Not applicable.

The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Systemic,

Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

**Dermal** 

Inhalable

Not applicable.

Not applicable.

Not applicable

Not applicable

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable. Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 178/239 Short term exposure, Systemic, Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

Since the substance is not classified for acute effects and therefore, no acute DNEL

Short term exposure, Local, Dermal Not applicable

Not applicable.

has been derived.

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**Route of exposure** 

Long term exposure, Systemic, **Dermal** 

**Contributing scenarios** Not applicable.

**Dose/Concentration** 

**Justification** 

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Not applicable.

0.30

0.11

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable

Not applicable.

Not applicable.

Not applicable

Not applicable.

Not applicable.

Not applicable. Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Combined

Short term exposure, Local, Dermal Not applicable

Not applicable

Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local,

Inhalable

Not applicable.

1.22

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

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

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Organisational measures to prevent/limit release from site:

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Not available.

1860

Not available.

Continuous release.

365

1300

1 00x10-5

1.00x10-4

0.185

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

Conditions and measures related to municipal sewage treatment

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 2420 Fraction of Regional tonnage used locally: 20% 484 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1326 Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

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

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1 00x10-5

0.02

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** 

**Amounts used:** 

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Liquid. Covers concentrations up to 2%

Not applicable.

Indoor. industrial setting Indoor. professional setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Indoor. professional setting

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg Other given operational conditions affecting workers Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

exposure:

Technical conditions and measures to control dispersion

from source towards the worker: Organisational measures to prevent/limit releases, Not applicable.

Not applicable.

Not applicable.

dispersion and exposure:

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09,

PROC13, PROC16 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

#### **Personal protection:**

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics:** 

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Liquid. Covers concentrations up to 2%

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting Indoor. professional setting

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### 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 dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 2%

**Amounts used:** Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting Indoor, professional setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use:

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

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

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting Indoor, professional setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09,

PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Treatment of articles by dipping and pouring

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used:

Frequency and duration of use:

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

Human factors not influenced by risk management:

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Indoor, industrial setting Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Not applicable.

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be

Not applicable.

expected

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used:

Frequency and duration of use:

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

Human factors not influenced by risk management:

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Indoor, industrial setting Indoor. professional setting

exposure:

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09,

PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	5.10x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.37x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.63x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.42x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.18x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Total release for regional

exposure estimation kg/day

Release from point source

(local exposure estimation) kg/

	day	3.1,	
Waste water	11.5	547	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	4.6x10-4	0.116	EUSES calculation
Soil (direct releases only)	Not evaluated.	5.96	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	4.14	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-3	9.5x10-3	<b>EUSES</b> calculation
Marine water mg/l	4.7x10-3	4.8x10-3	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	1.4	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.39	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Justification

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

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

**Local concentration** PEC soil (local+regional) **Justification EUSES** calculation Agricultural soil averaged mg/kg Not evaluated. 3.38x10-4 Grassland averaged mg/kg dwt Not evaluated. 3.3x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. 9.2x10-6 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. 1.3x10-7 **EUSES** calculation Annual average mg/m<sup>3</sup> 1.3x10-7 1.3x10-7 **EUSES** calculation Annual deposition mg/m²/d 6 5x10-7 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Total release for regional

exposure estimation kg/day

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Release from point source

(local exposure estimation) kg/

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Aimuai deposition mg/m /d	Local concentration	PEC aquatic (local+regional)	Justification
Annual average mg/m³ Annual deposition mg/m²/d	3.35x10-8 1.70x10-7	3.35x10-8 Not evaluated.	EUSES calculation EUSES calculation
During emission mg/m³	3.35x10-8	Not evaluated.	EUSES calculation
Booton contrator manage	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	5.94x10-6	EUSES calculation
Grassland averaged mg/kg dwt	3.86x10-6	3.79x10-4	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.98x10-6	3.77x10-4	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.284	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	2.63	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	8.68x10-5	8.89x10-4	EUSES calculation
Fresh water mg/l	6.67x10-5	8.21x10-3	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
Concentration in sewage (PECstp) mg/l	0.087	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
air (direct + STP)	1.21x10-4	0.231	EUSES calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
Waste water	<b>day</b> 0.241	737	EUSES calculation

### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

Route of exposure **Contributing scenarios Dose/Concentration** 

Long term exposure, Systemic,

**Dermal** 

Inhalable

Not applicable.

0.055

**Justification** 

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the exposure estimates for other PROC are

below this value

0.61 The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable.

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b 186/239

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Since the substance is not Not applicable. classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.22 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Calendering operations Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.055 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Since the substance is not Not applicable. classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13. PROC16

below this value

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

highest exposure level is given since the exposure estimates for other PROC are

ERC08d, ERC10b

Section 3:.2 Workers - Exposure esti Contributing scenario controlling we containers at non-dedicated facilities	orker exposure for 2: Transfe	r of substance or preparation (char	ging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.110	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling we containers at dedicated facilities		r of substance or preparation (char	ging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.055	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Pentaethylenehexamine, PEHA		Identified use name: Use of n	reparations containing ethylenamines in open

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial **Process Category:** PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Since the substance is not Not applicable. classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: 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, The ECETOC TRA tool has been used to 0.055 Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, 0.61 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Since the substance is not Not applicable. classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, Not applicable. 1 22 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 5: Treatment of articles by dipping and pouring Route of exposure **Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.110 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.305 Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13. PROC13.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

below this value

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

ERC08d, ERC10b

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Since the substance is not classified for Not applicable. Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Since the substance is not Not applicable. classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be **Route of exposure Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.055 estimate workplace exposures unless

expected

Dermal

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.61

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal Long term exposure, Local, Inhalable

Not applicable. Not applicable

Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, **Dermal** 

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived. Not applicable.

Short term exposure, Local, Dermal Not applicable

Since the substance is not classified for acute effects and therefore, no acute DNEL has

been derived.

Short term exposure, Local,

Inhalable

Not applicable.

1.22

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b 190/239 Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 7: Roller application or brushing

Route of exposure Long term exposure, Systemic, **Contributing scenarios** Not applicable.

**Dose/Concentration** 

Justification The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Dermal

Not applicable.

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal

Long term exposure, Local, Inhalable

Short term exposure, Systemic, **Dermal** 

Short term exposure, Systemic, Inhalable

Short term exposure, Systemic,

Combined

Short term exposure, Local, Dermal Not applicable

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable. Not applicable

Not applicable

Not applicable

Not applicable

Not applicable.

been derived.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Since the substance is not

classified for acute effects and therefore, no acute DNEL has

Not applicable.

Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the exposure estimates for other PROC are

below this value

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.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b



#### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5%

Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

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

Section 2.1	<ul> <li>Control of</li> </ul>	environmental	exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

1 00x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Not available.

1860

Maximum daily site tonnage (kg/day): Not available.

365

Other given operational conditions affecting environmental None.

1 00x10-5

1.00x10-4

0.185

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

Conditions and measures related to municipal sewage treatment

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 2420 Fraction of Regional tonnage used locally: 20% 484 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1326 Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

1 00x10-5

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Not available.

0.02

Release fraction to soil from wide dispersive use (regional

only):

Not available

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not available. Not applicable.

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 No air emission controls required; required removal efficiency is 0%.

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Not available

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

## Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

Not applicable.

**Product characteristics:** 

Liquid. Covers concentrations up to 0.5%

**Amounts used:** 

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Soil emission controls are not applicable as there is no direct release to soil.

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

# Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

#### **Personal protection:**

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

#### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Indoor. industrial setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### 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 dedicated facilities

**Product characteristics:** 

**Amounts used:** Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 0.5%

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing) **Product characteristics:** 

Liquid. Covers concentrations up to 0.5% Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Indoor, industrial setting

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor, industrial setting

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Using material as fuel sources, limited exposure to unburned product to be

expected

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09,

PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	5.10x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.37x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.63x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.42x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.18x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Total release for regional

exposure estimation kg/day

Release from point source

(local exposure estimation) kg/

	day		
Waste water	11.5	547	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	4.6x10-4	0.116	EUSES calculation
Soil (direct releases only)	Not evaluated.	5.96	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	4.14	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-3	9.5x10-3	EUSES calculation
Marine water mg/l	4.7x10-3	4.8x10-3	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	1.4	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.39	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

Justification

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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

**Local concentration** PEC soil (local+regional) **Justification** EUSES calculation Agricultural soil averaged mg/kg Not evaluated. 3.38x10-4 Grassland averaged mg/kg dwt Not evaluated. 3.3x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. 9.2x10-6 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ 1.3x10-7 Annual average mg/m<sup>3</sup> 1.3x10-7 1.3x10-7 **EUSES** calculation Annual deposition mg/m²/d 6 5x10-7 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Total release for regional

exposure estimation kg/day

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Release from point source

(local exposure estimation) kg/

	day		
Waste water	0.241	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.21x10-4	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.087	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.67x10-5	8.21x10-3	<b>EUSES</b> calculation
Marine water mg/l	8.68x10-5	8.89x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not applicable	2.63	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not applicable	0.284	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.98x10-6	3.77x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.86x10-6	3.79x10-4	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	5.94x10-6	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.35x10-8	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	3.35x10-8	3.35x10-8	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.70x10-7	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: 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** 

**Dermal** 

Justification

The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.027

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

0.76 Long term exposure, Systemic, Not applicable.

Inhalable

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the exposure estimates for other PROC are

below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Since the substance is not classified for Not applicable. Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Calendering operations Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Not applicable. 0.76 Long term exposure, Systemic, Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Long term exposure, Systemic, Not applicable. Combined Not applicable. Long term exposure, Local, Dermal Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

> 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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Section 3:.2 Workers - Exposure est Contributing scenario controlling we containers at non-dedicated facilities	orker exposure for 2: Transfe	r of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est			
Contributing scenario controlling wo containers at dedicated facilities	orker exposure for 3: Transfe	r of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.

Not applicable.

Pentaethylenehexamine, PEHA

Short term exposure, Systemic,

Inhalable

Not applicable

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

has been derived.

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

Sector of end use: SU03
Subsequent service life relevant for that use: No.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived 1.52 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: 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, The ECETOC TRA tool has been used to Not applicable. 0.027 Dermal estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.76 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Long term exposure, Systemic, Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.52 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 5: Roller application or brushing Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.76 The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Not applicable. Long term exposure, Systemic, Combined Pentaethylenehexamine, PEHA Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

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

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

Subsequent service life relevant for that use: No.

Sector of end use: SU03

ERC08d, ERC10b

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling we	orker exposure for 6: Treatme	ent of articles by dipping and po	puring
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

below this value

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 7: Using material as fuel sources, limited exposure to unburned product to be expected Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Since the substance is not classified for Long term exposure, Local, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.52 The ECETOC TRA tool has been used to

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.

Pentaethylenehexamine, PEHA

Inhalable

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10. PROC13. PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Sector of end use: 500.

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -

Professional

Process Category: PROC08a, PROC10

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

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use:

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Not available.

Continuous release.

1 00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC08a, PROC10 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage (kg/day):

Frequency and duration of use:

365 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Conditions and measures related to municipal sewage treatment

Not available.

Continuous release.

1 00x10-5

1.00x10-4

0.185

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Organisational measures to prevent/limit release from site:

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 2420 Fraction of Regional tonnage used locally: 20% 484 Annual site tonnage (tonnes/year): 1326 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Pentaethylenehexamine, PEHA

**Identified use name:** Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC08a, PROC10 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1.00x10-5

0.02

Not available.

Not available.

Not available Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27 7

Not available

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

Human factors not influenced by risk management:

(source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical removal efficiency of (%): 90%

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC10

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	5.10x10-6	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	<b>EUSES</b> calculation
Marine water mg/l	0	8.02x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	8.37x10-8	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	1.63x10-7	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	1.42x10-9	Not evaluated.	EUSES calculation
Annual average mg/m³	1.42x10-9	1.42x10-9	EUSES calculation
Annual deposition mg/m²/d	7.18x10-9	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	11.5	547	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	<b>EUSES</b> calculation
air (direct + STP)	4.6x10-4	0.116	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	5.96	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	4.14	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-3	9.5x10-3	<b>EUSES</b> calculation
Marine water mg/l	4.7x10-3	4.8x10-3	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	1.4	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.39	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
	<u> </u>		

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC10 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Agricultural soil averaged mg/kg Not evaluated. 3.38x10-4 **EUSES** calculation dwt Grassland averaged mg/kg dwt Not evaluated. 3.3x10-4 **EUSES** calculation 9.2x10-6 Groundwater mg/l Not evaluated. **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 1.3x10-7 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1.3x10-7 1.3x10-7 **EUSES** calculation Annual deposition mg/m²/d 6.5x10-7 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Justification Local concentration** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Wood preservative.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.241	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.21x10-4	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.087	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.67x10-5	8.21x10-3	<b>EUSES</b> calculation
Marine water mg/l	8.68x10-5	8.89x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.63	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.284	<b>EUSES</b> calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.98x10-6	3.77x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.86x10-6	3.79x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.94x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.35x10-8	Not evaluated.	EUSES calculation
Annual average mg/m³	3.35x10-8	3.35x10-8	EUSES calculation
Annual deposition mg/m²/d	1.70x10-7	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

containers at non-dedicated facilit	iles		
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.110	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Local, Dermal Not applicable.

Combined

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC10

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

Not applicable.

ERC08d, ERC10b

Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est			
Contributing scenario controlling we			
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.110	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL
			has been derived.

Inhalable

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

209/239

below this value

### 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5%

Professional

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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 (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

1 00x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage (kg/day): Frequency and duration of use:

365 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Not available.

Continuous release.

1 00x10-5

1.00x10-4

0.185

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Wood preservative.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 2420 Fraction of Regional tonnage used locally: 20% 484 Annual site tonnage (tonnes/year): 1326 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Pentaethylenehexamine, PEHA

**Identified use name:** Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1.00x10-5

0.02

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27 7

Not available

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

## Section 3:: Exposure estimation

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Release from point source Total release for regional Justification (local exposure estimation) kg/ exposure estimation kg/day day Waste water **EUSES** calculation 0 737 **Surface water** Not evaluated. 0 **EUSES** calculation air (direct + STP) 5.10x10-6 0.231 **EUSES** calculation Soil (direct releases only) Not evaluated. 6.94 **EUSES** calculation Value **Justification** 

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. Local concentration PEC aquatic (local+regional) **Justification** 0 8.15x10-3 Fresh water mg/l **EUSES** calculation Marine water mg/l 0 8.02x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 2.61 Marine water sediment mg/kg dwt Not evaluated. 0.256 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 8.37x10-8 3.75x10-4 **EUSES** calculation Grassland averaged mg/kg dwt 1.63x10-7 3.75x10-4 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated. 5.91x10-6 PEC air (local+regional) Local concentration **Justification** During emission mg/m<sup>3</sup> Not evaluated. 1.42x10-9 **EUSES** calculation Annual average mg/m<sup>3</sup> 1.42x10-9 1.42x10-9 **EUSES** calculation Annual deposition mg/m²/d 7.18x10-9 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration** Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use in detergents and cleaners, including professional

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	11.5	547	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	4.6x10-4	0.116	EUSES calculation
Soil (direct releases only)	Not evaluated.	5.96	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	4.14	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-3	9.5x10-3	EUSES calculation
Marine water mg/l	4.7x10-3	4.8x10-3	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	1.4	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.39	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	Not evaluated.	3.38x10-4	EUSES calculation
Grassland averaged mg/kg dwt	Not evaluated.	3.3x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	9.2x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.3x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	1.3x10-7	1.3x10-7	EUSES calculation
Annual deposition mg/m²/d	6.5x10-7	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Wood preservative.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.241	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.21x10-4	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.087	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.67x10-5	8.21x10-3	EUSES calculation
Marine water mg/l	8.68x10-5	8.89x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.63	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.284	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.98x10-6	3.77x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.86x10-6	3.79x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.94x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.35x10-8	Not evaluated.	EUSES calculation
Annual average mg/m³	3.35x10-8	3.35x10-8	EUSES calculation
Annual deposition mg/m²/d	1.70x10-7	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic,	Not applicable	Not applicable.	Since the substance is not classified for

Pentaethylenehexamine, PEHA

Combined

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

has been derived.

Process Category: PROC08a

acute effects and therefore, no acute DNEL

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: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

Short term exposure, Local, Dermal Not applicable

Not applicable.

Not applicable.

1.52

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

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

Short term exposure, Local,

Inhalable

**Environment** Not available. Health Not available.

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

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

Process Category: 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: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b



### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of

preparations containing EA up to 0.5% - Industrial

Subsequent service life relevant for that use: No.

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649 Maximum daily site tonnage (kg/day):

Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Process Category: PROC21, PROC24

Sector of end use: SU22 Environmental Release Category: ERC06d

Not available.

Continuous release.

365

1.00x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

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

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available. Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

1.00x10-5

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Continuous release.

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day): Not available

300 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

218/239

Frequency and duration of use:

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

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

1 00x10-5

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

prevent release:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55.1

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

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

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not applicable.

Continuous release.

365

1.00x10-5

1.00x10-4

0.02

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

=>27.7

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

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

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

Not available.

1300

5.00x10-3

Not available

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% 967 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2649 Not available.

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

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

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

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release: 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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant:

1.00x10-5

Not available.

Not available.

Not available. Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 0.5%

**Amounts used:** Not applicable. Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Indoor, professional setting

Other given operational conditions affecting workers

Technical conditions and measures at process level

Not applicable.

(source) to prevent release: Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

Not applicable. dispersion and exposure:

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Not applicable. Human factors not influenced by risk management:

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Other given operational conditions affecting workers Indoor, professional setting

exposure: Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	<b>EUSES</b> calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg	0	3.75x10-4	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. **EUSES** calculation 5.91x10-6 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 0 **EUSES** calculation Not evaluated. Annual average mg/m³ 0 **EUSES** calculation 6.87x10-13 Annual deposition mg/m²/d 0 **EUSES** calculation Not evaluated. **Local concentration** PEC aquatic (local+regional) Justification Not applicable. Micro-organism mg/l Not applicable. Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Fresh water sediment mg/kg dwt Not evaluated. 2.61 **EUSES** calculation Not evaluated. Marine water sediment mg/kg dwt 0.259 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.81x10-7 3.75x10-4 **EUSES** calculation 3.52x10-7 Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l 5.91x10-6 **EUSES** calculation Not evaluated. **Local concentration** PEC air (local+regional) Justification During emission mg/m<sup>3</sup> 3.06x10-9 Not evaluated. EUSES calculation Annual average mg/m<sup>3</sup> 3.06x10-9 3.06x10-9 **EUSES** calculation Annual deposition mg/m²/d 1.55x10-8 Not evaluated. EUSES calculation **Local concentration** PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.012	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10⁴	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10 <sup>-4</sup>	5.42x10 <sup>-4</sup>	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10 <sup>-4</sup>	7.01x10 <sup>-4</sup>	EUSES calculation
Groundwater mg/l	Not evaluated.	8.61x10 <sup>-6</sup>	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.45x10 <sup>-6</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10 <sup>-6</sup>	2.83x10 <sup>-6</sup>	EUSES calculation
Annual deposition mg/m²/d	1.44x10 <sup>-5</sup>	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Lube oil use

Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
8.49x10 <sup>-4</sup>	737	EUSES calculation
Not evaluated.	0	EUSES calculation
8.49x10 <sup>-6</sup>	0.231	EUSES calculation
Not evaluated.	6.94	Table R16.23[ REACH ]
Value	Justification	
3.07x10 <sup>-4</sup>	EUSES calculation	
0	EUSES calculation	
	(local exposure estimation) kg/day 8.49x10 <sup>-4</sup> Not evaluated. 8.49x10 <sup>-6</sup> Not evaluated. Value 3.07x10 <sup>-4</sup>	(local exposure estimation) kg/ day  8.49x10 <sup>-4</sup> Not evaluated.  8.49x10 <sup>-6</sup> Not evaluated.  Value  3.07x10 <sup>-4</sup> EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Fresh water mg/l Marine water mg/l Intermittent release. mg/l	Local concentration 2.35x10 <sup>-7</sup> 3.05x10 <sup>-7</sup> Not applicable.	PEC aquatic (local+regional) 8.15x10-3 8.02x10-4 Not applicable.	Justification EUSES calculation EUSES calculation Not applicable.
Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration  Not evaluated.  Not evaluated.	PEC sediment (local+regional) 2.61 0.257	Justification EUSES calculation EUSES calculation
Agricultural soil averaged mg/kg dwt	Local concentration 8.40x10 <sup>-8</sup>	PEC soil (local+regional) 3.75x10 <sup>-4</sup>	Justification EUSES calculation
Grassland averaged mg/kg dwt Groundwater mg/l	1.64x10 <sup>-7</sup> Not evaluated.	3.75x10 <sup>4</sup> 5.91x10 <sup>6</sup>	EUSES calculation EUSES calculation
During emission mg/m³ Annual average mg/m³ Annual deposition mg/m²/d	Local concentration 2.36x10° 1.42x10° 7.21x10°	PEC air (local+regional)  Not evaluated.  1.42x10 <sup>-9</sup> Not evaluated.	Justification EUSES calculation EUSES calculation EUSES calculation
Micro-organism mg/l	Local concentration  Not applicable.	PEC aquatic (local+regional)  Not applicable.	Justification Not applicable.

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ergy manipulation of substance	s bound in materials and/or articles
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.06	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.12	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

Section 3:.2 Workers - Exposure estimation

Dermal

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Route of exposure

Contributing scenarios

Dose/Concentration

Justification

Long term exposure, Systemic,

Not applicable.

0.001

The ECETOC TRA tool has been used to

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

highest exposure level is given since the exposure estimates for other PROC are

below this value

below this value

Pentaethylenehexamine, PEHA Identified use name: Handling of solid products with small amounts of

unbound ethylenamines - Use of preparations containing EA up to 0.5% Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No.

sequent service life relevant for that use: No.

Environmental Release Category: ERC06d

Long term exposure, Systemic, Not applicable. 0.06 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Not applicable Long term exposure, Local, Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.12 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of

preparations containing EA up to 2% - Industrial

Process Category: PROC21, PROC24

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

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

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 967 Average Local Daily Tonnage (kg/day): 2649 Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Sector of end use: SU22

365

1.00x10-5

Not available.

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable

Not available.

Not available.

1.00x10-5

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1240 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: Continuous release.

300 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2%

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

228/239

. Industrial

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

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

1 00x10-5

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 100 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 20.1 Average Local Daily Tonnage (kg/day): 55.1

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1300 Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

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

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release: 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

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not applicable.

365

None.

1.00x10-5

1.00x10-4

0.02

Not available

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available

=>27.7

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 20% Annual site tonnage (tonnes/year): 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 None Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

5.00x10-3

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>27.7

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 20%

967 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% . Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Local freshwater dilution factor: 1300 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

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

Technical conditions and measures at process level (source) to prevent release:

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 Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1.00x10-5

Not available.

Not available.

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available.

## Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 2%

**Amounts used:** Not applicable. Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Indoor, professional setting

Other given operational conditions affecting workers Technical conditions and measures at process level

Not applicable.

(source) to prevent release: Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Not applicable.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Other given operational conditions affecting workers Indoor, professional setting

exposure:

Not applicable.

Technical conditions and measures at process level (source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

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

**Personal protection:** 

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.027	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
Grassland averaged mg/kg dwt	8.48x10-4	1.22x10-3	EUSES calculation
Groundwater mg/l	Not evaluated.	1.29x10-5	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.37x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.37x10-6	7.37x10-6	EUSES calculation
Annual deposition mg/m²/d	3.74x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. **EUSES** calculation 5.91x10-6 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 0 **EUSES** calculation Not evaluated. Annual average mg/m³ 0 **EUSES** calculation 6.87x10-13 Annual deposition mg/m²/d 0 **EUSES** calculation Not evaluated. **Local concentration** PEC aquatic (local+regional) Justification Not applicable. Micro-organism mg/l Not applicable. Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	3.75x10-4	EUSES calculation
Groundwater mg/l	Not evaluated.	5.91x10-6	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	6.87x10-13	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Laboratory chemicals

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.022	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	1.10x10-5	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	7.96x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	6.09x10-6	8.15x10-3	EUSES calculation
Marine water mg/l	7.92x10-6	8.10x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Fresh water sediment mg/kg dwt Not evaluated. 2.61 **EUSES** calculation Not evaluated. Marine water sediment mg/kg dwt 0.259 **EUSES** calculation Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.81x10-7 3.75x10-4 **EUSES** calculation 3.52x10-7 Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation Groundwater mg/l 5.91x10-6 **EUSES** calculation Not evaluated **Local concentration** PEC air (local+regional) **Justification** During emission mg/m<sup>3</sup> 3.06x10-9 Not evaluated. EUSES calculation Annual average mg/m<sup>3</sup> 3.06x10-9 3.06x10-9 **EUSES** calculation Annual deposition mg/m²/d 1.55x10-8 Not evaluated. EUSES calculation **Local concentration** PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	0.012	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	8.15x10-3	EUSES calculation
Marine water mg/l	0	8.02x10 <sup>-4</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.67x10 <sup>-4</sup>	5.42x10 <sup>-4</sup>	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10 <sup>-4</sup>	7.01x10 <sup>-4</sup>	EUSES calculation
Groundwater mg/l	Not evaluated.	8.61x10 <sup>-6</sup>	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	3.45x10 <sup>-6</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10 <sup>-6</sup>	2.83x10 <sup>-6</sup>	EUSES calculation
Annual deposition mg/m²/d	1.44x10 <sup>-5</sup>	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Lube oil use

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	8.49x10 <sup>-4</sup>	737	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
air (direct + STP)	8.49x10 <sup>-6</sup>	0.231	EUSES calculation
Soil (direct releases only)	Not evaluated.	6.94	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.07x10 <sup>-4</sup>	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0	EUSES calculation	

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC06d 234/239

Fresh water mg/l Marine water mg/l Intermittent release. mg/l	Local concentration 2.35x10 <sup>-7</sup> 3.05x10 <sup>-7</sup> Not applicable.	PEC aquatic (local+regional) 8.15x10-3 8.02x10-4 Not applicable.	Justification EUSES calculation EUSES calculation Not applicable.
Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration  Not evaluated.  Not evaluated.	PEC sediment (local+regional) 2.61 0.257	Justification EUSES calculation EUSES calculation
Agricultural soil averaged mg/kg dwt	Local concentration 8.40x10 <sup>-8</sup>	PEC soil (local+regional) 3.75x10 <sup>4</sup>	Justification EUSES calculation
Grassland averaged mg/kg dwt Groundwater mg/l	1.64x10 <sup>-7</sup> Not evaluated.	3.75x10 <sup>-4</sup> 5.91x10 <sup>-6</sup>	EUSES calculation EUSES calculation
During emission mg/m³ Annual average mg/m³ Annual deposition mg/m²/d	Local concentration 2.36x10° 1.42x10° 7.21x10°	PEC air (local+regional)  Not evaluated.  1.42x10 <sup>-9</sup> Not evaluated.	Justification EUSES calculation EUSES calculation EUSES calculation
Micro-organism mg/l	Local concentration  Not applicable.	PEC aquatic (local+regional)  Not applicable.	Justification Not applicable.

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ergy manipulation of substance	s hound in materials and/or articles
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0003	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.02	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Not applicable. 0.03 The ECETOC TRA tool has been used to Inhalable

estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Contributing scenarios** Dose/Concentration **Route of exposure Justification** 

Long term exposure, Systemic,

Pentaethylenehexamine, PEHA

Dermal

Not applicable. 0.0003

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC21, PROC24 Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC06d

Long term exposure, Systemic, Not applicable. 0.02 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable Not applicable. Not applicable. Combined Not applicable. Not applicable. Not applicable. Long term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for Long term exposure, Local, acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.03 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

#### 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



Industrial

#### Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

**Product definition UVCB** 

**Product name** Pentaethylenehexamine, PEHA

Section 1:: Title

Short title of the exposure scenario/List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation

as most likely exposure form - Use of preparations containing EA up to 25% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c,

ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): Not available. Fraction of Regional tonnage used locally: Not available Annual site tonnage (tonnes/year): Not available. Average Local Daily Tonnage (kg/day): Not available Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use:

Emission Days (days/year): Not available.

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

Release fraction to air from process (initial release prior to Not available

RMM):

Release fraction to soil from process (initial release prior to Not available.

RMM):

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

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

Not available

Not available.

Not available.

Not available

Not available.

If discharging to domestic sewage treatment plant, provide

Not available.

the required onsite wastewater removal efficiency of 3 (%):

Conditions and measures related to municipal sewage treatment

plant:

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

preparations containing EA up to 25% - Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09 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: ERC01, ERC02, ERC04, ERC05,

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

# **Section 3:: Exposure estimation**

Section	2.41	Environment	- Evnocuro	actimation
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Contributing scenario controlling environmental exposure for 0:

	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.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable.	Not applicable.	
Concentration in sewage sludge mg/kg dwt	Not applicable.	Not applicable.	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	Not applicable.	Not applicable.	Not applicable.
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not applicable.	Not applicable.	Not applicable.
Marine water sediment mg/kg dwt	Not applicable.		Not applicable.
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	Not applicable.	Not applicable.	Not applicable.
Grassland averaged mg/kg dwt	Not applicable.	Not applicable.	Not applicable.
Groundwater mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	Not applicable.	Not applicable.	Not applicable.
Annual average mg/m³	Not applicable.	Not applicable.	Not applicable.
Annual deposition mg/m²/d	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Contributing scenario controlling worker exposure for 0:

	-		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	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.	Not applicable.	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.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Industrial **Process Category:** PROC05, PROC08a, PROC08b, PROC09

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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a 238/239

## 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Pentaethylenehexamine, PEHA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 25% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09
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: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c,

ERC08d, ERC08e, ERC08f, ERC11a