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 -

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

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 -

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

responsible for this SDS

: SDS.Delamine@delamine.com

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

Product definition : UVCB

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

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SECTION 2: Hazards identification

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







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 : F SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with

water or shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable

for breathing. IF IN EYES:

Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. 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

Supplemental label

elements

: 3,6,9,12-tetra-azatetradecamethylenediamine

: Not applicable.

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SECTION 2: Hazards identification

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

: Not applicable.

: Not applicable.

fastenings

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

: **N**o

Other hazards which do not result in classification

: Not applicable.

SECTION 3: Composition/information on ingredients

Substance/mixture : UVCB

			Class	<u>ification</u>	
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 - 80	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	15 - 25	Xn; R21/22 C; R34 R43	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314	[A]

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SECTION 3: Composition/information on ingredients

3,6, 9-triazaundecamethylenediamine	EC: 203-986-2 CAS: 112-57-2 Index: 612-060-00-0	1 - 10	N; R50/53 Xn; R21/22 C; R34 R43 N; R51/53	Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1A, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[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.

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.

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SECTION 4: First aid measures

Ingestion

: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders

: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

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

reaction.

Ingestion: Harmful if swallowed. Corrosive to the digestive tract. Causes burns.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:

pain watering redness

Inhalation : 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, CO₂, 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 nitrogen oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters

: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. 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 material for containment and cleaning up

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SECTION 6: Accidental release measures

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.

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 Directive - Reporting thresholds (in tonnes)

Danger criteria

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SECTION 7: Handling and storage

	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. : No specific data. solutions

Industrial sector specific

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.

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 ²	Workers	Local
	DNEL	Short term Dermal	13 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Inhalation	2542 mg/	Consumers	Systemic
	DNEL	Short term Oral	32 mg/kg bw/day	Consumers	Systemic

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SECTION 8: Exposure controls/personal protection

DNEL	Short term Dermal	1.59 mg/	Consumers	Local
		cm ²	_	
DNEL	Long term Dermal		Consumers	Systemic
		bw/day		
DNEL	Long term	0.46 mg/m ³	Consumers	Systemic
	Inhalation			
DNEL	Long term Oral	•	Consumers	Systemic
		kg bw/day		
DNEL	Long term Dermal	•	Consumers	Local
		cm ²		

PNECs

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

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

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SECTION 8: Exposure controls/personal protection

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] **Odour** : Odourless. **Odour threshold** : Not available.

pH 12.6

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

Initial boiling point and boiling : 426°C

range

Flash point : Closed cup: 183°C

Evaporation rate : Not available. Flammability (solid, gas) : Not applicable. **Burning time** : Not applicable. **Burning rate** : Not applicable.

Upper/lower flammability or

explosive limits

Not available.

Vapour pressure : 0.0000017 kPa [room temperature]

Vapour density : Not available. : Not available. **Relative density** : Not available. Solubility(ies) Solubility in water : >500 g/l

Partition coefficient: n-octanol/ : -3.67

water

Auto-ignition temperature : 335°C

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SECTION 9: Physical and chemical properties

Decomposition temperature

: Not available.

Viscosity

: Not available.

Explosive properties

: Not applicable.

Oxidising properties

: None.

9.2 Other information

Density

: 1.003 g/cm³ [20°C]

Physical/chemical properties

comments

: No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity

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

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

10.5 Incompatible materials

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

acius.

Chlorinated hydrocarbon.

10.6 Hazardous decomposition products

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

accomposition products of

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

Irritation/Corrosion

Conclusion/Summary

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SECTION 11: Toxicological information

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	Negative
		Subject: Mammalian-Animal Cell: Germ	

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.

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SECTION 11: Toxicological information

Inhalation : No known significant effects or critical hazards.

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

reaction.

Ingestion : Marmful if swallowed. Corrosive to the digestive tract. Causes burns.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: Adverse symptoms may include the following:

pain watering redness

Inhalation : 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

effects

: No specific data.

Potential delayed effects :

: No specific data.

Long term exposure

Potential immediate

effects

: No specific data.

Potential delayed effects : No specific data.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
3,6,9,12-tetra- azatetradecamethylenediamine	Sub-chronic LOAEL Oral	Rat	52 mg/kg	-

Conclusion/Summary : Not classified as dangerous

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

to very low levels.

Carcinogenicity
 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.
 No known significant effects or critical hazards.

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

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SECTION 11: Toxicological information

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 Acute EC50 17.5 mg/l Fresh water Acute LC50 180 mg/l Fresh water Acute NOEC 0.25 mg/l Fresh water Chronic NOEC 0.8 mg/l Fresh water	Algae Daphnia Fish Algae Daphnia	72 hours 48 hours 96 hours 72 hours 14 days

Conclusion/Summary

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

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 : No

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

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

Methods of disposal

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

Special precautions

: This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

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	88
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	y es.

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SECTION 14: Transport information

_	- 1 - 1			
Additional	The environmentally	The environmentally	he marine pollutant	The environmentally
information	hazardous substance	hazardous substance	mark is not required	hazardous substance
	mark is not required	mark is not required	when transported in	mark may appear if
	when transported in	when transported in	sizes of ≤5 L or ≤5 kg.	required by other
	sizes of ≤5 L or ≤5 kg.	sizes of ≤5 L or ≤5 kg.		transportation
			Emergency	regulations.
	Hazard identification	Special provisions	schedules (EmS)	Passenger and
	number	274	F-A, S-B	Cargo Aircraft
	80		, -	Quantity limitation: 5 L
			Special provisions	Packaging instructions:
	Limited quantity		223, 274	852
	5 L			Cargo Aircraft Only
				Quantity limitation: 60
	Special provisions			I
	274			Packaging instructions:
	214			856
	Tunnel code			Limited Quantities -
	(E)			Passenger Aircraft
				Quantity limitation: 1 L
				Packaging instructions:
				Y841
				Special provisions
				A3, A803
				173.7003

14.6 Special precautions for user

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

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

: Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

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

Other EU regulations

: Not applicable.

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Pentaethylenehexamine, PEHA

SECTION 15: Regulatory information

Europe inventory

: All components are listed or exempted.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category

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 Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), concluded in Geneva on 30 September 1957 plus amendments (Uniform text: Journal of Laws 27/2009 pos. 162 plus amendments); Regulation for the transport of dangerous materials on the

Rhine (ADN); Occupational exposure limits; International regulations

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

Classification	Justification
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. H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.H411 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
 Aquatic Acute 1, H400 ACUTE AQUATIC HAZARD - Category 1
 Aquatic Chronic 1, H410 LONG-TERM AQUATIC HAZARD - Category 2

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

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

R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the

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

aquatic environment.

Full text of classifications

[DSD/DPD]

: C - Corrosive Xn - Harmful

N - Dangerous for the environment

Training advice : Ens

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revision

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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 UVCB

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

Not applicable.

Assessment Method

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.

1860 Regional use tonnage Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 1019 Average Local Daily Tonnage (kg/day)

Maximum daily site tonnage 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 0

prior to RMM)

Release fraction to wastewater from process (initial

release prior to RMM)

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-

site sewage treatment

Not available.

Total efficiency of removal from wastewater after onsite and off-site (domestic treatment plant) RMMs

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

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

Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal

Not available.

Assumed on-site sewage treatment plant flow

Not available.

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 1860 Fraction of Regional tonnage used locally 20% Annual site tonnage 372 1019 Average Local Daily Tonnage (kg/day)

Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release

Emission Davs (davs/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

prior to RMM)

Release fraction to wastewater from process (initial

release prior to RMM)

0.1

5.00x10-3

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-

site sewage treatment

Not available.

Total efficiency of removal from wastewater after onsite and off-site (domestic treatment plant) RMMs

Maximum allowable site tonnage (Msafe) based on

release following total wastewater treatment removal

Assumed on-site sewage treatment plant flow

Not available.

Not available.

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.

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

Maximum daily site tonnage 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:

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.

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 release prior to RMM)

Conditions and measures related to municipal sewage treatment plant:

Estimated substance removal from wastewater via onsite sewage treatment

Total efficiency of removal from wastewater after onsite and off-site (domestic treatment plant) RMMs

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal

Assumed on-site sewage treatment plant flow

Not available.

0

0

Not available.

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%

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.

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 a
- 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 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

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.

- 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 3 Exposure estimation and reference to its source

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: 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	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

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.

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

	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; 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	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	7.07x10-13	EUSES calculation
Annual deposition mg/m²/d	9.90x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification

Not applicable.

Section 3.1 Environment - Exposure estimation

Micro-organism mg/l

Contributing scenario controlling environmental exposure for 2: Lube oil use

Not applicable.

	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

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

Not applicable.

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

Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. mg/l Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. PEC aquatic (local+regional) **Justification Local concentration** Fresh water mg/l 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 Justification** PEC soil (local+regional) 3.75x10-4; Regional PEC [Total]: EUSES calculation Agricultural soil averaged mg/kg 3.71x10-4 Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation 5.91x10-6 Groundwater mg/l Not evaluated. **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m³ 0 6.87x10-13 **EUSES** calculation Annual deposition mg/m²/d n Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Justification Local concentration** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Exposure estimation - Consumers

Exposure estimation and reference to its source - Consumers: 2: Use in detergents and cleaners, including professional

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

article::

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

Adhesives, sealants - 3; 3; 2; 2 Mixing and loading:

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:

Mode of release: evaporation

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

including professional

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

applied (g):

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

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

scenario Molecular (Update model):

weight (g/mole):

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

Dermal:

Application methods: instant

Pentaethylenehexamine, PEHA

Identified use name: Consumer uses of ethyleneamines Sector of end use: SU21 Subsequent service life relevant for that use: No.

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

ventilation rate: (I/h):

ERC08e, ERC08f Market sector by type of chemical product: PC01. PC09b

Article category related to subsequent service life: Not applicable.

Surface area (Skin contact **Uptake fraction (Update Product amount (g):** 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/m³ Dermal External dose (mg/kg Dermal load (mg/cm2): Dermal (Internal 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): 0.002; 0.001; 5E-4; 0.001 0.0002; 0.0001; 5E-5; 0.0001 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 Frequency (1/Year): Weight fraction of **Body weight:** Calculation method: scenario:

substance in the article::

Adhesives, sealants - 3; 3; 2; 2 **Exposure estimation and** 25%; 5%; 25%; 5% 60 kg ConsExpo 4.1

Mixing and loading; reference to its source -Adhesives, sealants -Consumers: 3: Use of coatings Application(s); Fillers, and adhesives putties, plasters, modelling clay -Mixing and loading: Fillers, putties, plasters, modelling

clay - Application(s)

Inhalation:

Mode of release: evaporation Exposure estimation and reference to its source -

Consumers: 4: Use of coatings and adhesives

Application duration: Amount/concentration **Exposure (minutes):** Room volume (m³): Room volume x ventilation rate: (I/h): applied (g):

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

Contributing **Uptake fraction** Inhalation rate:

Release area (cm2): Temperature (°C): Mass transfer rate: scenario Molecular (Update model):

weight (g/mole):

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

Dermal:

Application methods: instant

Surface area (Skin contact **Uptake fraction (Update** Product amount (g): 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/m³ Dermal load (mg/cm2): Dermal External dose (mg/kg Dermal (Internal 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

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

(90% efficiency) mg/kg bw/day

(Long term exposure):

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

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.

0.6

Section 3.2 Exposure estimation - Consumers

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

Contributing scenario:

Frequency (1/Year):

Weight fraction of substance in the

Body weight:

60 kg

Calculation method:

Exposure estimation and reference to its source -

Adhesives, sealants -3; 3; 2; 2 Mixing and loading:

25%; 5%; 25%; 5%

article::

ConsExpo 4.1

Consumers: 7: Lube oil use

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

Inhalation:

evaporation Mode of release:

Exposure estimation and reference to its source -

Consumers: 8: Lube oil use

Exposure (minutes): Application duration: Amount/concentration applied (g):

Room volume (m³):

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

5: 90: 5: 90

5; 30; 5; 30

20; 20; 200; 200

1; 20; 1; 20

Release area (cm2):

Temperature (°C): Mass transfer rate: Contributing

Uptake fraction (Update model): Inhalation rate:

scenario Molecular weight (g/mole):

20; 500; 100; 50

20

3.09E+03

550

1

32.9

0.6

Dermal:

Application methods: instant

Surface area (Skin contact

Product amount (g):

Uptake fraction (Update

Inhalation event (mg/m³):

area) cm2: 2; 43; 2; 22

0.05; 0.1; 0.02; 1

model):

11.2; 3.0; 11.5; 3.1

Inhalation mg/m³

(Concentration on day of

exposure):

Dermal load (mg/cm2):

Dermal External dose (mg/kg bw):

Dermal (Internal dose) mg/kg

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

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 Inhalation (mg/kg/day) Long

term exposure:

0.002; 0.001; 5E-4; 0.001

11.2; 3.0; 11.5; 3.1

(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

Contributing scenarios

Dose/Concentration

Justification

Long term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Dermal Long term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Inhalable

Not applicable.

Not applicable.

Long term exposure, Systemic, Combined

Not applicable.

Long term exposure, Local, Dermal Long term exposure, Local,

Not applicable. Not applicable.

Not applicable. Not applicable.

Not applicable. Not applicable.

Inhalable

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.

Long term exposure, Systemic, Oral		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 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			
Contributing scenario controlling co		f coatings and adhesives	
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			
Contributing scenario controlling co		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.

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, ERC08a, ERC08e, ERC08f

Market sector by type of chemical product: PC01, PC09b Article category related to subsequent service life: 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.

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

Environment Not applicable. Health Not applicable. Additional guidance 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

Market sector by type of chemical product: PC01, PC09b Article category related to subsequent service life: Not 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: 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	t environmental	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 4840 Fraction of Regional tonnage used locally 20% 967 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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:

1.00x10-5

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)

Not available.

Release fraction to soil from wide dispersive use (regional

Not available.

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

Not applicable.

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

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:

Fraction of EU tonnage used in region Not available.

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

Maximum daily site tonnage 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 None.

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 air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Technical on-site conditions and measures to reduce or limit

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

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

Organisational measures to prevent/limit release from site:

1860

300

RMM)

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

only)

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

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

the required onsite wastewater removal efficiency of

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.

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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region

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

Maximum daily site tonnage

Frequency and duration of use:

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Conditions and measures related to municipal sewage treatment

plant:

Not available.

1860

1240

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.

Organisational measures to prevent/limit release from site:

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 Not available.

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

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

Maximum daily site tonnage 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

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

Fechnical 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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:

Not available. Fraction of EU tonnage used in region

1860 Regional use tonnage 20% Fraction of Regional tonnage used locally 372 Annual site tonnage Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release

365 **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

Release fraction to air from process (initial release prior to

RMM)

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 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 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) =>27.7 to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

0.01

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%.

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:

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:

Solid. Covers concentrations up to 0.5%

Not applicable.

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

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 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics:

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

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:

Solid. Covers concentrations up to 0.5%

Not applicable.

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

Indoor professional setting

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

Justification

Total release for regional

Section 3: Exposure estimation

Section 3.1	Environment	- Exposure	estimation
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

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)	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	

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

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.

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	
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.

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

Justification

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 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/	exposure estimation kg/day	
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
Intermittent release. 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 0.5% -

Justification

Total release for regional

Professional

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 Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 2.61 0.258	Justification EUSES calculation 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	9.90	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.	0.001	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 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.	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 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, Not applicable. 0.001 The ECETOC TRA tool has been used to 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. 0.06 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

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.

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.

Inhalable

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 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. 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 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: 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



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: 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 o	f environmenta	l 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 4840 Fraction of Regional tonnage used locally 20% 967 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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:

1.00x10-5

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)

Not available.

Release fraction to soil from wide dispersive use (regional

Not available.

Release fraction to wastewater from wide dispersive use

Not available.

Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

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:

Fraction of EU tonnage used in region Not available.

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

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

300

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: 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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage Frequency and duration of use:

Emission Days (days/year) 300

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Continuous release

1300

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 Not available.

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

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

Maximum daily site tonnage 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

1.00x10-5

RMM)

Release fraction to soil from process (initial release prior to

RMM)

1.00x10-4

0.02

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.

Release fraction to wastewater from wide dispersive use Not available.

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

Not applicable.

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

If discharging to domestic sewage treatment plant, provide

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

to provide the required removal efficiency of

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

=>27.7

Not available.

the required onsite wastewater removal efficiency of

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:

Not available. Fraction of EU tonnage used in region

1860 Regional use tonnage 20% Fraction of Regional tonnage used locally 372 Annual site tonnage Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release

365 **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)

0

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

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 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) =>27.7 to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

0.01

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%.

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: 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.

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

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 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics:

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

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:

Solid. Covers concentrations up to 2%

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

Indoor professional setting

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

45/2₇₉

Total release for regional

Justification

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	exposure estimation kg/day	
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)	Not applicable as there is no release to wastewater.	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% -Professional

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

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

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.

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	
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.

Pentaethylenehexamine, PEHA

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

Justification

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 3: Laboratory chemicals

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
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/day	exposure estimation kg/day	
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
Intermittent release. 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

Justification

Justification

Total release for regional

Total release for regional

Process Category: PROC21, PROC24

Sector of end use: SU22 relevant for that use: No.

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

Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 2.61 0.258	Justification EUSES calculation 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.

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

below this value

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

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

Long term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

0.02

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

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 Not applicable.

below this value

Long term exposure, Systemic,

Combined

Inhalable

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, 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,

Short term exposure, Local,

Inhalable

Inhalable

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 Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined

0.03

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 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: 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



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

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 1.86x10-4 Fraction of Regional tonnage used locally 3.72x10-3 3.72x10-3 Annual site tonnage 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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

exposure:

Indoor industrial setting

Release fraction to air from process (initial release prior to

1x10-5

Release fraction to soil from process (initial release prior to

1x10-4

Release fraction to wastewater from process (initial release

prior to RMM)

1.61x10-8

Release fraction to air from wide dispersive use (regional

Not available.

Release fraction to soil from wide dispersive use (regional

Not available.

Release fraction to wastewater from wide dispersive use

Not available.

Technical conditions and measures at process level (source) to

prevent release:

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

51/279

Industrial

Technical on-site conditions and measures to reduce or limit 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

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

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow

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:

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

Maximum daily site tonnage Frequency and duration of use:

Emission Days (days/year)

Environment factors not influenced by risk management:

1000 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

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:

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Not available.

Continuous release

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.

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

Conditions and measures related to municipal sewage treatment plant:

Assumed on-site sewage treatment plant flow

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 Fraction of Regional tonnage used locally **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2000

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

3720

20%

744

365

1300

1000

Indoor industrial setting

0

Not available.

Not available.

Not available.

Not applicable.

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.

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

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 3720 Fraction of Regional tonnage used locally **Annual site tonnage** 744 Average Local Daily Tonnage (kg/day): 2038

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow

Not available.

20%

Not available.

Continuous release

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.

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.

2000

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

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:

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:

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

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 1: Use in closed, continuous process with occasional controlled exposure

Product characteristics: Amounts used:

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

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.

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 2: Use in closed batch process (synthesis or formulation)

Product characteristics:

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:

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%

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

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:

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:

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

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. 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)

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 percentage substance in the product up to 100%

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. 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

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:

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

Not applicable.

Avoid carrying out operation for more than 1 hour.

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.

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

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 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

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.

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)

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:

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

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. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

Section 2.2 Control of worker exposure

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

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:

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

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%

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 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	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.

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

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

Release from point source

	day	, in the same same	
Waste water	1064x10-4	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.

(local exposure estimation) kg/ exposure estimation kg/day

Total release for regional

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	day 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

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, PROC05

Justification

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

Intermittent release. mg/l	Not applicable Local concentration	Not applicable PEC sediment (local+regional)	Not applicable. 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
	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 3.1 Environment - Exposure estimation

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

Total release for regional

Release from point source

	(local exposure estimation) kg/day	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
	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 100% - Industrial

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

Justification

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

Pouto of expenses		closed process, no likelihood of	
Route of exposure Long term exposure, Systemic, Dermal	Contributing scenarios 1.1	Dose/Concentration 0.007	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	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 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	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 since the exposure estimates for other PROC are below this value
Section 3.2 Workers - Exposure esti			a consideral controlled conseque
Contributing scenario controlling w Route of exposure	Contributing scenarios	Dose/Concentration	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.	0.548	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,	Not applicable	Not applicable.	Since the substance is not classified for

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

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.	0.55	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
Section 3.2 Workers - Exposure esti	mation		
Contributing scenario controlling we		closed batch process (synthesis	s or formulation)
Route of exposure	Contributing scenarios	Dose/Concentration	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,	Not applicable.	0.62	The ECETOC TRA tool has been used to

Inhalable

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

below this value

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

Substance supplied to that use in form of: As such

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, ERC06a

Section 3.2 Workers - Exposure estil Contributing scenario controlling we		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
Section 3.2 Workers - Exposure esti			
Contributing scenario controlling we (multistage and/or significant contact		or blending in batch processes	for formulation of preparations and articles
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

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.

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
relevant for that use: No

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	1.4	0.60	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 5: 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	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	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	1.5	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

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

		r of substance or preparation (c	charging/discharging) from/to vessels/large
containers at dedicated facilities 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.
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 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 DNEI 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
Section 3.2 Workers - Exposure esti	mation		
Contributing scenario controlling weighing)	orker exposure for 7: 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	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

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Local, Dermal Not applicable.

Long term exposure, Systemic,

Combined

Not applicable.

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

below this value

Not applicable.

Not applicable.

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	1.3	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 estimates			
Contributing scenario controlling we			
Route of exposure	Contributing scenarios	Dose/Concentration	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

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

below this value

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

Substance supplied to that use in form of: As such

exposure estimates for other PROC are

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.

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, 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

1x10-5

1x10-4

Not available.

Not available.

Section 2: Operational conditions and risk management measures

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. 1.86x10-4 Regional use tonnage Fraction of Regional tonnage used locally 3.72x10-3 **Annual site tonnage** 3.72x10-3 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

1.61x10-8 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

Not available.

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

prevent release:

Not applicable.

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

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

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

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Not available.

=>27.7

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow 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 1.86x10-4 3.72x10-3 Fraction of Regional tonnage used locally **Annual site tonnage** 3.72x10-3 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Frequency and duration of use: Continuous release

Emission Days (days/year)

Environment factors not influenced by risk management:

1000 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Not available.

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.

Pentaethylenehexamine, PEHA

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

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow

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.

3720 Regional use tonnage Fraction of Regional tonnage used locally **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2000

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

20%

744

Not available.

365

1300

Indoor industrial setting

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.

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 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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow

Not available.

Continuous release

365

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.

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.

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%

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:

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.

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: 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

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.

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 dedicated facilities

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

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 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 2.2 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 from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

Not applicable.

dispersion and exposure:

rtot 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/

	day		
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

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

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	5.93x105	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.

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	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

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 Bb PROC09

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

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
	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 3.1 Environment - Exposure estimation

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

Total release for regional

Release from point source

	(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
	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% -

Justification

ndustrial ⊃R∩∩∩o

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 3.2 Workers - Exposure esti Contributing scenario controlling we		or blending in batch processes	for formulation of preparations and articles
(multistage and/or significant contact	•	Dose/Concentration	lundification
Route of exposure Long term exposure, Systemic, Dermal	Contributing scenarios 2.1	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
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 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 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	2.1	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 esti			
Contributing scenario controlling we containers at non-dedicated facilitie		r of substance or preparation (o	charging/discharging) from/to vessels/large
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

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Systemic,

Long term exposure, Local, Dermal Not applicable.

Combined

Not applicable.

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

below this value

Not applicable.

Not applicable.

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

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

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	2.2	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 estil Contributing scenario controlling we containers at dedicated facilities		er of substance or preparation (charging/discharging) from/to vessels/large
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

Pentaethylenehexamine, PEHA

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

below this value

. 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

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

Section 3.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 3: 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. 0.005

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, 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,

Not applicable Inhalable

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.

Inhalable

Inhalable

Dermal

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 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. 1.22 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. Not applicable. Health **Additional Good Practices** 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



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

Indoor industrial setting

1.61x10-8

Not available.

Not available.

Not available.

Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control	of environmental	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 Not available. 1.86x10-4 Regional use tonnage Fraction of Regional tonnage used locally 3.72x10-3 **Annual site tonnage** 3.72x10-3 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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

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

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

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:

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

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

plant:

Assumed on-site sewage treatment plant flow 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 1.86x10-4 3.72x10-3 Fraction of Regional tonnage used locally **Annual site tonnage** 3.72x10-3 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Not available.

Frequency and duration of use:

Emission Days (days/year)

Environment factors not influenced by risk management:

1000 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Continuous release

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.

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

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow

2000

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Formulation of preparations

Operational conditions: Indoor use

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region

3720 Regional use tonnage Fraction of Regional tonnage used locally **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2000

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

20%

744

Not available.

365

1300

Indoor industrial setting

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 2.1 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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow

2038

Not available.

Continuous release

365

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.

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.

2000

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

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

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,

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: 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:

Frequency and duration of use:

Not applicable. 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:

Organisational measures to prevent/limit releases,

Not applicable.

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

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 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

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:

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.

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

Justification

management supervision controls.

Total release for regional

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/	exposure estimation kg/day	oustineation
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

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

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	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

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

1			
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
	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 3.1 Environment - Exposure estimation

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

Total release for regional

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
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.

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% -

Justification

inaustria DDCCC

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 3.2 Workers - Exposure estil Contributing scenario controlling we		or blending in batch processes	for formulation of preparations and articles
(multistage and/or significant contact	ct)		
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 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 esti	mation		
-	orker exposure for 1: Transfe	er of substance or preparation (o	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	3.1	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	3.1	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

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Systemic,

Long term exposure, Local, Dermal Not applicable.

Combined

Not applicable.

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

below this value

Not applicable.

Not applicable.

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

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

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	3.1	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 estimates			_
Contributing scenario controlling we containers at dedicated facilities	orker exposure for 2: Transfer of	f substance or preparation (charg	ing/discharging) from/to vessels/large
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

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

below this value

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC06a

Section 3.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 3: 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,

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, 0.76 The ECETOC TRA tool has been used to

0.001

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, 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, 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

Inhalable

Dermal

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 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.

1.52

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 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. Not applicable. Health **Additional Good Practices** 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



Professional

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 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

Indoor industrial setting

Not available.

Not available.

Not available.

Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in regionNot available.Regional use tonnage1.86x10-4Fraction of Regional tonnage used locally3.72x10-3Annual site tonnage3.72x10-3Average Local Daily Tonnage (kg/day):10192

Maximum daily site tonnage 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

sure:

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

RMM)

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

only)

J...**y**,

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:

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

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

plant:

Assumed on-site sewage treatment plant flow

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:

Amounts used:

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

Maximum daily site tonnage Not available. Frequency and duration of use:

Emission Days (days/year)

Environment factors not influenced by risk management:

1000 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Not applicable.

Continuous release

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.

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

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow

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

Maximum daily site tonnage 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

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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

3720

365

1300

Indoor industrial setting

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.

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

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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage Frequency and duration of use:

Emission Days (days/year) 225

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow

Not available.

Continuous release

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.

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.

2000

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

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

Liquid. Covers concentrations up to 2% **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:

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

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

dav

Release from point source

(local exposure estimation) kg/

Danta othy Janahayamina DELIA		Identified was named lies of	athy damanainaa in alaaa
	Local concentration	PEC aquatic (local+regional)	Justification
Annual deposition mg/m²/d	1.44x10-4	Not evaluated.	EUSES calculation
Annual average mg/m³	2.83x10-5	2.83x10-5	EUSES calculation
During emission mg/m³	2.83x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	3.28x10-5	EUSES calculation
Grassland averaged mg/kg dwt	3.26x10-3	3.64x10-3	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.67x10-3	2.05X10-3	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.256	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	2.61	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
Marine water mg/l	5.9x10-8	8.02x10-4	EUSES calculation
Fresh water mg/l	5.9x10-8	8.15x10-3	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	5.93x10-5	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
air (direct + STP)	0.102	0.231	EUSES calculation
Surface water	Not evaluated.	0	EUSES calculation
Waste water	1.64x10-4	737	EUSES calculation
1	uay		

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

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.

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

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

Justification

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

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
	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 3.1 Environment - Exposure estimation

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

Total release for regional

Release from point source

	(local exposure estimation) kg/ day	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.

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

Justification

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 3.2 Workers - Exposure esti Contributing scenario controlling w containers at non-dedicated facilitie	orker exposure for 0: Transfe	r of substance or preparation (d	charging/discharging) from/to vessels/large
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.
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, Combined

Short term exposure, Systemic,

Short term exposure, Systemic,

Dermal

Inhalable

Not applicable

Not applicable

Not applicable

Short term exposure, Local, Dermal Not applicable

Short term exposure, Local, Inhalable

2.2

Not applicable.

Not applicable.

Not applicable.

Not applicable.

0.61

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

Since the substance is not classified for

Since the substance is not classified for

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

acute effects and therefore, no acute DNEL

acute effects and therefore, no acute DNEL

has been derived.

has been derived.

has been derived.

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 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



Professional

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 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

Indoor industrial setting

Not available.

Not available.

Not available.

Not applicable.

Section 2: Operational conditions and risk management measures

Section 2.1 Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use

Product characteristics: Not applicable.

Amounts used:

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

Maximum daily site tonnage 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

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

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

1.61x10-8 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:

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

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

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

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Prevent discharge of undissolved substance to or recover from onsite wastewater.

Not available.

=>27.7

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

Assumed on-site sewage treatment plant flow 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 1.86x10-4 3.72x10-3 Fraction of Regional tonnage used locally Annual site tonnage 3.72x10-3 10192 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Not available. Frequency and duration of use:

Emission Days (days/year)

Environment factors not influenced by risk management:

1000 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Continuous release

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.

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

Conditions and measures related to municipal sewage treatment

Assumed on-site sewage treatment plant flow

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.

3720 Regional use tonnage Fraction of Regional tonnage used locally **Annual site tonnage** 744 Average Local Daily Tonnage (kg/day): 2000

Maximum daily site tonnage 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

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) If discharging to domestic sewage treatment plant, provide

to provide the required removal efficiency of

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

20%

Not available.

365

1300

Indoor industrial setting

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 2.1 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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Assumed on-site sewage treatment plant flow

Not available.

Continuous release

225

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.

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.

2000

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: 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

Professional

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

Liquid. Covers concentrations up to 0.5% **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:

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

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

day

Release from point source

(local exposure estimation) kg/

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

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

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.

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	
	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

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% -

Justification

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

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
	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 3.1 Environment - Exposure estimation

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

Total release for regional

Release from point source

	(local exposure estimation) kg/ day	exposure estimation kg/day	Justinication
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.

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% -

Justification

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 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

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

Combined

Dermal

Inhalable

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, 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, Since the substance is not classified for 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 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.

Not applicable. Short term exposure, Local, 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 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 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



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition UVCB

Pentaethylenehexamine. PEHA **Product name**

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	Contro	l of e	nvironme	nta	l 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 4840 Fraction of Regional tonnage used locally 20% 967 Annual site tonnage 2649 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

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:

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Maximum daily site tonnage Not available. Continuous release 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

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 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not applicable.

300

1300

1000

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% - 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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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

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

Fechnical 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

1240

Not available.

300

1300

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% - 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 3: Lube oil use Operational conditions: Indoor/Outdoor use Product characteristics: Not applicable. Amounts used: Not available. Fraction of EU tonnage used in region Regional use tonnage 1300 Fraction of Regional tonnage used locally 20% 260 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 1182 Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release **Emission Days (days/year)** 220 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-3 RMM) Release fraction to wastewater from process (initial release 1.00x10-3 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. Release fraction to wastewater from wide dispersive use Not available.

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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

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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 109/279

Section 2.1 Control of environmental exposure Contributing scenario controlling environmental exposure for 4: Laboratory chemicals Operational conditions: Indoor use Product characteristics: Not applicable. Amounts used: Not available. Fraction of EU tonnage used in region Regional use tonnage 100 Fraction of Regional tonnage used locally 20% 20.1 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 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 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. Treat on-site wastewater (prior to receiving water discharge) =>27.7 to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d,

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,

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: Not available. Fraction of EU tonnage used in region Regional use tonnage 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 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) Not available. Release fraction to air from wide dispersive use (regional Release fraction to soil from wide dispersive use (regional Not available. 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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 15%

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.

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 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)

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 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: Spraying in industrial settings and applications

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

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.

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. Wear appropriate respiratory protection. with a minimum efficacy 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:

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 15%

Not applicable.

Exposure duration per day: 1-4 hour(s)

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 4: 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

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 5: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

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:

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.

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 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.

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring Liquid. Covers concentrations up to 15%

Product characteristics:

Not applicable.

Amounts used:

Frequency and duration of use: Human factors not influenced by risk management: Exposure duration per day: 1-4 hour(s)

Other given operational conditions affecting workers

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

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 7: Production of preparations or articles by tabletting, compression, extrusion,

Not applicable.

pelletisation

Product characteristics: Liquid. Covers concentrations up to 15%

Amounts used:

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

Other given operational conditions affecting workers

Indoor industrial setting

exposure:

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 removal efficiency of 90%

Technical conditions and measures to control

dispersion from source towards the worker: 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.

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 3.1 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)	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 15% - Industrial Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

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

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.

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	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

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

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.

Release from point source

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Lube oil use

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
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/ 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	

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

Justification

Total release for regional

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 117/279

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	Local concentration 1.81x10-7	PEC soil (local+regional) 3.75x10-4	Justification EUSES calculation
dwt	1.81x10-7	3.75x10-4	EUSES calculation
dwt Grassland averaged mg/kg dwt	1.81x10-7 3.52x10-7	3.75x10-4 3.75x10-4	EUSES calculation EUSES calculation
dwt Grassland averaged mg/kg dwt	1.81x10-7 3.52x10-7 Not evaluated.	3.75x10-4 3.75x10-4 5.91x10-6	EUSES calculation EUSES calculation EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l	1.81x10-7 3.52x10-7 Not evaluated. Local concentration	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional)	EUSES calculation EUSES calculation EUSES calculation Justification
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³	1.81x10-7 3.52x10-7 Not evaluated. Local concentration 3.06x10-9	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional) Not evaluated.	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³ Annual average mg/m³	1.81x10-7 3.52x10-7 Not evaluated. Local concentration 3.06x10-9 3.06x10-9	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional) Not evaluated. 3.06x10-9	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation EUSES calculation

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

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

PEC air (local+regional) Local concentration **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 Contributing scenarios **Dose/Concentration Justification** The ECETOC TRA tool has been used to

Long term exposure, Systemic,

Dermal

Not applicable.

0.0822

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 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.

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,

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 1: Calendering operations

Not applicable.

Route of exposure Long term exposure, Systemic,

Dermal

Contributing scenarios

Dose/Concentration

0.0822

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 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, Not applicable. 0.457 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. Not applicable. Since the substance is not classified for Short term exposure, Systemic, 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, 0.914 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: Spraying in industrial settings and applications **Contributing scenarios Dose/Concentration** Route of exposure **Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.1286 **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 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 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

Not applicable.

Pentaethylenehexamine, PEHA

Short term exposure, Systemic,

Not applicable

Dermal

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 15% - Industrial

has been derived.

has been derived.

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14

ERC08e, ERC08f, ERC11a

acute effects and therefore, no acute DNEL

acute effects and therefore, no acute DNEL

Since the substance is not classified for

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,

Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, 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. 0.914 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 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **Contributing scenarios Dose/Concentration** Route of exposure **Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.0411 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 Inhalable 0.548 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. Not applicable. Short term exposure, Systemic, 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. 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. 0.914 The ECETOC TRA tool has been used to Inhalable 1.097 estimate workplace exposures unless otherwise indicated. The PROC with 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 15% - Industrial

below this value

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

PROC09, PROC13, PROC14

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

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

containers at dedicated facilities	Contailenting	Dana (Composition Com	lugalification
Route of exposure Long term exposure, Systemic, Dermal	Contributing scenarios Not applicable.	Dose/Concentration 0.0822	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	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 DNI 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 DNI 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 DNI 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 DNI 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 DNI 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 esti	mation		
		er of substance or preparation in	to 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
	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic,			
	Not applicable.	Not applicable.	Not applicable.

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, 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, 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. 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. 0.914 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 6: Treatment of articles by dipping and pouring **Contributing scenarios** Route of exposure **Dose/Concentration Justification** Long term exposure, Systemic, 0.0411 The ECETOC TRA tool has been used to 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 0.548 The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 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. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** 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, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived.

Not applicable.

Pentaethylenehexamine, PEHA

Short term exposure, Local, Dermal 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 15% - Industrial

has been derived.

Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14

Since the substance is not classified for acute effects and therefore, no acute DNEL

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, 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

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** Long term exposure, Systemic,

Dermal

Not applicable.

Dose/Concentration

Justification 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

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 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

Since the substance is not classified for

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

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

Not available. **Environment** 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 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

1.00x10-5

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 C	control of	environmental	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 4840
Fraction of Regional tonnage used locally 20%
Annual site tonnage 967
Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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

er given operational conditions affecting environmental 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 Not available.

only)

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

only)

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, PROC040, PROC04

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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

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 1860 Fraction of Regional tonnage used locally **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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

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

Not applicable.

20%

1240

Not available.

Continuous release

300

1300

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.

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 126/279 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

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 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 1860 Fraction of Regional tonnage used locally **Annual site tonnage** 372 1240 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

20%

Not available.

300

None.

1.00x10-5

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.

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 3: Lube oil use Operational conditions: Indoor/Outdoor use Product characteristics: Not applicable. Amounts used: Not available. Fraction of EU tonnage used in region Regional use tonnage 1300 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 260 Average Local Daily Tonnage (kg/day): 1182 Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release **Emission Days (days/year)** 220 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-3 RMM) Release fraction to wastewater from process (initial release 1.00x10-3 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.

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

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.

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 4: Laboratory chemicals Operational conditions: Indoor use Product characteristics: Not applicable. Amounts used: Not available. Fraction of EU tonnage used in region Regional use tonnage 100 Fraction of Regional tonnage used locally 20% 20.1 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 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 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. Treat on-site wastewater (prior to receiving water discharge) =>27.7 to provide the required removal efficiency of

Not available.

Pentaethylenehexamine, PEHA

plant:

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

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

nstance 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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 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) Not available. Release fraction to air from wide dispersive use (regional Release fraction to soil from wide dispersive use (regional Not available. 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 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 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

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 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 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

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 2: Spraying in industrial settings and applications

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.

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. Wear appropriate respiratory protection. with a minimum efficacy 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

Not applicable.

Not applicable.

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:

Personal protection:

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:

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

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

management supervision controls.

removal efficiency of 90%

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:

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

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 5: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

Product characteristics:

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:

Liquid. Covers concentrations up to 2%

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.

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

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.

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 6: Roller application or brushing of adhesive and other coating

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)

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 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 7: Treatment of articles by dipping and pouring

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

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

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

Amounts used: Not applicable.

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

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

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

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 9: Hand-mixing with intimate contact and only PPE available

Product characteristics:

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:

Liquid. Covers concentrations up to 2%

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

Justification

management supervision controls.

Total release for regional

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/ exposure estimation kg/day day Waste water 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.

Justification **Value** Not applicable as there is no Concentration in sewage (PECstp) **EUSES** calculation

release to wastewater. mg/l

Concentration in sewage sludge mg/kg dwt release to wastewater.

Not applicable as there is no **EUSES** calculation

Local concentration PEC aquatic (local+regional) Justification 8.15x10-3 **EUSES** calculation

Fresh water mg/l 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,

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ERC08e, ERC08f, ERC11a

	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.
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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.

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 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	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: 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

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 136/279

2.35x10-7	8.15x10-3	EUSES calculation
3.05x10-7	8.02x10-4	EUSES calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.257	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
8.40x10-8	3.75x10-4	EUSES calculation
1.64x10-7	3.75x10-4	EUSES calculation
Not evaluated.	5.914x10-6	EUSES calculation
Local concentration	PEC air (local+regional)	Justification
2.36x10-9	Not evaluated.	EUSES calculation
1.42x10-9	1.42x10-9	EUSES calculation
7.21x10-9	Not evaluated.	EUSES calculation
Local concentration	PEC aquatic (local+regional)	Justification
Not applicable.	Not applicable.	Not applicable.
	3.05x10-7 Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration 8.40x10-8 1.64x10-7 Not evaluated. Local concentration 2.36x10-9 1.42x10-9 7.21x10-9 Local concentration	3.05x10-7 Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration PEC sediment (local+regional) Not evaluated. Decal concentration 8.40x10-8 1.64x10-7 Not evaluated. Local concentration PEC soil (local+regional) 3.75x10-4 1.64x10-7 Not evaluated. Local concentration PEC air (local+regional) 2.36x10-9 1.42x10-9 7.21x10-9 Not evaluated. Local concentration PEC aquatic (local+regional)

Total release for regional

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Laboratory chemicals

Release from point source

Waste water Surface water air (direct + STP) Soil (direct releases only)	day 0.022 Not evaluated. 1.10x10-5 Not evaluated. Value 7.96x10-3	737 0 0.231 6.94 Justification	EUSES calculation EUSES calculation EUSES calculation Not applicable.
air (direct + STP)	1.10x10-5 Not evaluated.	0.231 6.94	EUSES calculation
	Not evaluated. Value	6.94	
Soil (direct releases only)	Value		Not applicable.
		Justification	
	7.96x10-3		
Concentration in sewage (PECstp) mg/l		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

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,

Justification

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

Not applicable. Micro-organism mg/l 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

Section 3.2 Workers - Exposure estimation

Micro-organism mg/l

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.

Route of e	exposure	Contributing scenarios	Dose/Concentration	Justification
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Not applicable.

Long term exposure, Systemic, Not applicable. 0.05

The ECETOC TRA tool has been used to 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

Not applicable.

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

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, 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 below this value
Section 3.2 Workers - Exposure esting			_
Contributing scenario controlling we	orker exposure for 1: Calend	ering operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
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, 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

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

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. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a

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

Section 3.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 2: Spraying in industrial settings and applications

Contributing scenarios

Route of exposure

Long term exposure, Systemic, Dermal

Not applicable.

Dose/Concentration

0.09

Justification

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

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.

Not applicable.

Long term exposure, Systemic,

Combined

Long term exposure, Local, Dermal

Long term exposure, Local,

Inhalable

Short term exposure, Local, Dermal 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

Since the substance is not classified for

has been derived.

Short term exposure, Systemic, Dermal

Short term exposure, Systemic,

Inhalable

Not applicable

Not applicable

Not applicable.

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.

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. Since the substance is not 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 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure

Long term exposure, Systemic,

Dermal

Contributing scenarios

Not applicable.

Dose/Concentration Not applicable.

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 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, 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 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.	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

Route of exposure

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

Dose/Concentration

Contributing scenarios

Long term exposure, Systemic, Dermal	Not applicable.	0.05 0.09	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 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,

Justification

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, 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 esti	mation		
Contributing scenario controlling weighing)	orker exposure for 5: Transfe	r of substance or preparation ir	nto small containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
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, 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.	Not applicable.	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with 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 2% - Industrial Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC19

below this value

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

Sector of end use: SU03

highest exposure level is given since the 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

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.09	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 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.	1.22	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 esting Contributing scenario controlling wo		ent of articles by dipping and po	ourina
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.

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, 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, 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 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. 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 8: Production of preparations or articles by tabletting, compression, extrusion, pelletisation 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 Not applicable. 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. 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. 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. 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.

Pentaethylenehexamine, PEHA

Short term exposure, Local, Dermal 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 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

has been derived.

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

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d, ERC08e, ERC08f, ERC11a 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 9: Hand-mixing with intimate contact and only PPE available

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

Long term exposure, Systemic,

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

Long term exposure, Systemic,

Inhalable

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, Not applicable. Not applicable. Not applicable.

Combined

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

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.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic,

Short term exposure, Local, Dermal Not applicable

Combined

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.

Short term exposure, Local,

Inhalable

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

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% - 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 145/279



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition UVCB

Pentaethylenehexamine. PEHA **Product name**

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 C	control o	f environmenta	il 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 4840 Fraction of Regional tonnage used locally 20% 967 Annual site tonnage 2649 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

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:

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

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

plant:

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 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 1860 Fraction of Regional tonnage used locally 372 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 1240

Maximum daily site tonnage Not available. Continuous release 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 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:

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

20%

300

1300

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.

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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

Release fraction to wastewater from wide dispersive use

Fechnical 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

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 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 3: Lube oil use
Operational conditions: Indoor/Outdoor use
Product characteristics:

Amounts used:

Fraction of EU tonnage used in region
Regional use tonnage
Fraction of Regional tonnage used locally

Not available.
20%

Maximum daily site tonnage Not available.

Frequency and duration of use: Continuous release

Emission Days (days/year) 220

Environment factors not influenced by risk management:

Average Local Daily Tonnage (kg/day):

Annual site tonnage

Local freshwater dilution factor 1300

Local marine water dilution factor 1000

Other given operational conditions affecting environmental 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 If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

.. .. .

260

1182

1.00x10-5

1.00x10-3

1.00x10-3

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.

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 4: Laboratory chemicals Operational conditions: Indoor use Product characteristics: Not applicable. Amounts used: Not available. Fraction of EU tonnage used in region Regional use tonnage 100 Fraction of Regional tonnage used locally 20% 20.1 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 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 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. Treat on-site wastewater (prior to receiving water discharge) =>27.7

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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: Not available. Fraction of EU tonnage used in region Regional use tonnage 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 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) Not available. Release fraction to air from wide dispersive use (regional Release fraction to soil from wide dispersive use (regional Not available. Release fraction to wastewater from wide dispersive use 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:

harges, 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 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

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

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:

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: Spraying in industrial settings and applications

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:

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.

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 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large

Not applicable.

containers at non-dedicated facilities

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used:

exposure:

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

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:

Not applicable.

Organisational measures to prevent/limit releases,

Not applicable.

dispersion and exposure:

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 3: 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 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

Not applicable.

(source) to prevent release:

Not applicable.

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 4: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

Liquid. Covers concentrations up to 0.5%

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

Indoor industrial setting

exposure:

Indoor industrial setting and professional setting

Indoor professional setting

Technical conditions and measures at process level

Organisational measures to prevent/limit releases,

Not applicable.

(source) to prevent release:

Not applicable.

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

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: Roller application or brushing of adhesive and other coating

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)

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 Indoor industrial setting and professional setting

exposure:

Indoor professional setting

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

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

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.

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

Product characteristics:

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

Amounts used:

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%

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

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.

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 7: Production of preparations or articles by tabletting, compression, extrusion,

Not applicable.

pelletisation

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

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 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:

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 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Waste water	(local exposure estimation) kg/ day 0	exposure estimation kg/day 737	EUSES calculation
Surface water	Not evaluated. 0.027	0 0.231	EUSES calculation
air (direct + STP) Soil (direct releases only)	Not evaluated.	6.94	EUSES calculation
Soil (direct releases only)			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	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 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

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 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

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

Annual average mg/m³ 0 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: 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

	(local exposure estimation) kg/	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	

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 157/279

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
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	Local concentration 1.81x10-7	PEC soil (local+regional) 3.75x10-4	Justification EUSES calculation
		· · · · · · · · · · · · · · · · · · ·	
dwt	1.81x10-7	3.75x10-4	EUSES calculation
dwt Grassland averaged mg/kg dwt	1.81x10-7 3.52x10-7	3.75x10-4 3.75x10-4	EUSES calculation
dwt Grassland averaged mg/kg dwt	1.81x10-7 3.52x10-7 Not evaluated.	3.75x10-4 3.75x10-4 5.91x10-6	EUSES calculation EUSES calculation EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l	1.81x10-7 3.52x10-7 Not evaluated. Local concentration	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional)	EUSES calculation EUSES calculation EUSES calculation Justification
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³	1.81x10-7 3.52x10-7 Not evaluated. Local concentration 3.06x10-9	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional) Not evaluated.	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³ Annual average mg/m³	1.81x10-7 3.52x10-7 Not evaluated. Local concentration 3.06x10-9 3.06x10-9	3.75x10-4 3.75x10-4 5.91x10-6 PEC air (local+regional) Not evaluated. 3.06x10-9	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation EUSES calculation

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

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 158/279

PEC air (local+regional) Local concentration **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 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 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

Dermal

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, Combined

Not applicable

Not applicable.

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

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. 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 1: Spraying in industrial settings and applications

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

Long term exposure, Systemic, Not applicable.

Dermal

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

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

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 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.	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 econario controlling worker exposure for 2: Transfer of substance or propagation (charging/discharging) from/to vessels/large

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 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 DNI 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% - 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

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. 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 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Dose/Concentration Contributing scenarios 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 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. Not applicable. Short term exposure, Systemic, 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. 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. 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

Not applicable.

Not applicable

Short term exposure, Systemic,

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

PROC10, PROC13, PROC14
Substance supplied to that use in form of: In a mixture

exposure estimates for other PROC are

Since the substance is not classified for

Sector of end use: \$U03, \$U22

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

including weighing)			
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 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.	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 esting Contributing scenario controlling wo		pplication or brushing of adhes	ive and other coating
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
1 1			

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Local, Dermal Not applicable.

Long term exposure, Systemic,

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

Not applicable.

Not applicable.

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 162/279 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, 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. 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 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 6: Treatment of articles by dipping and pouring **Contributing scenarios** Route of exposure **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 Not applicable. The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 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. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** 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, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived.

Not applicable.

Pentaethylenehexamine, PEHA

Short term exposure, Local, Dermal 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.

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14

Since the substance is not classified for acute effects and therefore, no acute DNEL

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, 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

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.

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

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

has been derived

Short term exposure, Systemic, Inhalable

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.

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

Not available. **Environment** 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% - 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

Pentaethylenehexamine. PEHA **Product name**

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 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 4840 Fraction of Regional tonnage used locally 20% 967 Annual site tonnage 2649 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

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 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Conditions and measures related to municipal sewage treatment plant:

Organisational measures to prevent/limit release from site:

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 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 Fraction of Regional tonnage used locally 20% 372 **Annual site tonnage** Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Continuous release 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 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not applicable.

1860

1240

Not available.

300

1300

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

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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

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 2.1 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 Not available. Regional use tonnage 100 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 20.1 Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. =>27.7

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

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 2.1 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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 RMM) Release fraction to soil from process (initial release prior to 5.00x10-3 RMM) Release fraction to wastewater from process (initial release 0.01 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. 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 169/279

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 25%

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:

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

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

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. 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

Release from point source Total release for regional **Justification** (local exposure estimation) kg/ exposure estimation kg/day

day

Waste water 737 **EUSES** calculation Surface water Not evaluated. 0 **EUSES** calculation air (direct + STP) 0.027 0.231 **EUSES** calculation Soil (direct releases only) 6.94 Not applicable. Not evaluated.

Justification 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 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 (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
	Land announted to	DEC soil (local-regional)	Justification
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	4.35x10-4	8.10x10-4	EUSES calculation
dwt	4.35x10-4	8.10x10-4	EUSES calculation
dwt Grassland averaged mg/kg dwt	4.35x10-4 8.48x10-4	8.10x10-4 1.22x10-3	EUSES calculation
dwt Grassland averaged mg/kg dwt	4.35x10-4 8.48x10-4 Not evaluated.	8.10x10-4 1.22x10-3 1.29x10-5	EUSES calculation EUSES calculation EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l	4.35x10-4 8.48x10-4 Not evaluated. Local concentration	8.10x10-4 1.22x10-3 1.29x10-5 PEC air (local+regional)	EUSES calculation EUSES calculation EUSES calculation Justification
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³	4.35x10-4 8.48x10-4 Not evaluated. Local concentration 7.37x10-6	8.10x10-4 1.22x10-3 1.29x10-5 PEC air (local+regional) Not evaluated.	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³ Annual average mg/m³	4.35x10-4 8.48x10-4 Not evaluated. Local concentration 7.37x10-6 7.37x10-6	8.10x10-4 1.22x10-3 1.29x10-5 PEC air (local+regional) Not evaluated. 7.37x10-6	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation EUSES calculation
dwt Grassland averaged mg/kg dwt Groundwater mg/l During emission mg/m³ Annual average mg/m³	4.35x10-4 8.48x10-4 Not evaluated. Local concentration 7.37x10-6 7.37x10-6 3.74x10-5	8.10x10-4 1.22x10-3 1.29x10-5 PEC air (local+regional) Not evaluated. 7.37x10-6 Not evaluated.	EUSES calculation EUSES calculation EUSES calculation Justification EUSES calculation EUSES calculation EUSES calculation

Section 3.1 Environment - Exposure estimation

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

Release from point source

	exposure estimation kg/day	
0	737	EUSES calculation
Not evaluated.	0	EUSES calculation
0	0.231	EUSES calculation
Not evaluated.	6.94	Not applicable.
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	EUSES calculation
Not applicable.	Not applicable.	EUSES calculation
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
0	3.75x10-4	EUSES calculation
0	3.75x10-4	EUSES calculation
Not evaluated.	5.91x10-6	EUSES calculation
Local concentration	PEC air (local+regional)	Justification
0	Not evaluated.	EUSES calculation
	Not evaluated. Value Not applicable as there is no release to wastewater. Not applicable as there is no release to wastewater. Local concentration Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration 0 Not evaluated. Local concentration 0 Not evaluated. Local concentration	Not evaluated. O O O O O O O O O O O O O O O O O O

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

Justification

Total release for regional

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 171/279 Annual average mg/m³ 0 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 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	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 3: Laboratory chemicals

Justification Release from point source Total release for regional (local exposure estimation) kg/ exposure estimation kg/day day Waste water 0.022 737 **EUSES** calculation Surface water Not evaluated. n **EUSES** calculation air (direct + STP) 1.10x10-5 0.231 **EUSES** calculation Soil (direct releases only) Not evaluated. 6.94 Not applicable. **Value Justification** 7.96x10-3 **EUSES** calculation Concentration in sewage (PECstp)

mg/l

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 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.	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.	0.259	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.

Total release for regional

exposure estimation kg/day

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	or produce community and	
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
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.	0.258	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

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

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

Annual deposition mg/m²/d

9.90x10-14

Not evaluated.

Not applicable.

Dose/Concentration

EUSES calculation

Micro-organism mg/l

Local concentration

Not applicable.

PEC aquatic (local+regional)

Justification 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

Long term exposure, Systemic, Dermal

Contributing scenarios

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.

Not applicable.

0.365575

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. 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.

Short term exposure, Systemic,

Short term exposure, Systemic,

Inhalable

Dermal

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.

0.73115

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

Route of exposure

Long term exposure, Systemic, Dermal

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

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

0.45697 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. 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. 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, 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, 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, Not applicable. 0.91393 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 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.

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

Pentaethylenehexamine. PEHA **Product name**

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 4840 Fraction of Regional tonnage used locally 20% 967 Annual site tonnage 2649 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

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% - Professional

ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d,

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,

ERC08e, ERC08f, ERC11a

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Conditions and measures related to municipal sewage treatment plant:

Organisational measures to prevent/limit release from site:

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

Maximum daily site tonnage Continuous release 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

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Not applicable.

Not available.

1860

Not available.

300

1300

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

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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Continuous release

300

1300

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

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 Not available. Regional use tonnage 100 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 20.1 Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. Treat on-site wastewater (prior to receiving water discharge) =>27.7

to provide the required removal efficiency of If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Not available.

Organisational measures to prevent/limit release from site:

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 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 2.1 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: Not available. Fraction of EU tonnage used in region Regional use tonnage 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 RMM) Release fraction to soil from process (initial release prior to 5.00x10-3 RMM) Release fraction to wastewater from process (initial release 0.01 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. 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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%

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.

Exposure duration per day: 15 min to <1 hour(s)

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: Roller application or brushing of adhesive and other coating

Product characteristics:

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:

Liquid. Covers concentrations up to 15%

Exposure duration per day: 15 min to <1 hour(s)

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

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 2: Spraying outside industrial settings and/or applications

Product characteristics:

Liquid. Covers concentrations up to 10% 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:

Amounts used:

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

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: 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.

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	
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	

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 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

Justification

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.

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

	reduced from point ocurse	rotal rolouse for regional	Guotinoution
	(local exposure estimation) kg/	exposure estimation kg/day	
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

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

183/279

Justification

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	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 Total release for regional Justification (local exposure estimation) kg/ exposure estimation kg/day

day

Waste waterNot applicable.737EUSES calculationSurface waterNot evaluated.0EUSES calculationair (direct + STP)Not applicable.0.231EUSES calculationSoil (direct releases only)Not evaluated.6.94Not applicable.

Value Justification

Concentration in sewage (PECstp) 3.68x10-3 EUSES calculation mg/l

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

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.

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 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 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 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% - 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

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 estimation

Contributing scenario controlling worker exposure for 1: Roller application or brushing of adhesive and other coating

Not applicable.

Dose/Concentration

Justification

Long term exposure, Systemic,

Dermal

Route of exposure

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.

Contributing scenarios

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 Not applicable.

Long term exposure, Local,

Inhalable

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.

Short term exposure, Systemic, **Dermal**

Short term exposure, Systemic,

Inhalable

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.

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

Dermal

Not applicable.

Not applicable.

0.914

0.214

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: Spraying outside industrial settings and/or applications

Route of exposure Long term exposure, Systemic, **Contributing scenarios**

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

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

0.121 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 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. 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. Short term exposure, Systemic, Not applicable. Since the substance is not classified for 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, 0.243 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

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 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 4840
Fraction of Regional tonnage used locally 20%
Annual site tonnage 967
Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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

er given operational conditions affecting environmental None.

Other given operational conditions affecting environmental exposure:

Polo

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

Release fraction to soil from process (initial release prior to

RMM)

KIVIIVI)

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

Release fraction to air from wide dispersive use (regional

onlv)

Release fraction to soil from wide dispersive use (regional

only)

Release fraction to wastewater from wide dispersive use

Not available.

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 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 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Maximum daily site tonnage Not available. Continuous release 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

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 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not applicable.

1860

300

1300

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 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

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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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

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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

300

1300

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 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 2.1 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 Not available. Regional use tonnage 100 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 20.1 Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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: No air emission controls required; required removal efficiency is 0%.

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

=>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 191/279

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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 RMM) Release fraction to soil from process (initial release prior to 5.00x10-3 RMM) Release fraction to wastewater from process (initial release 0.01 prior to RMM) Release fraction to air from wide dispersive use (regional Not available.

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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:

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

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

Organisational measures to prevent/limit releases,

Net a self-self-

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: Spraying outside industrial settings and/or applications

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:

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.

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

minimum efficacy of 90%

n

0.231

6.94

Section 3: Exposure estimation

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

0.027

Release from point source (local exposure estimation) kg/

Total release for regional exposure estimation kg/day

Justification

Not applicable.

Waste water
Surface water
air (direct + STP)

day 0 Not evaluated. 737

EUSES calculation EUSES calculation EUSES calculation

Soil (direct releases only)

Not evaluated.

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

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.

Total release for regional

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	
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
1			

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

Justification

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

Annual deposition mg/m²/d Not evaluated.

Local concentration

Micro-organism mg/l Not applicable. PEC aquatic (local+regional)

EUSES calculation **Justification**

Not applicable.

Justification

Section 3.1 Environment - Exposure estimation

Waste water

Surface water

air (direct + STP)

Soil (direct releases only)

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

Release from point source Total release for regional (local exposure estimation) kg/ exposure estimation kg/day

737 **EUSES** calculation **EUSES** calculation Not evaluated. **EUSES** calculation 0.231 Not evaluated. 6.94 Not applicable.

Not applicable.

Value Justification EUSES calculation Concentration in sewage (PECstp) Not applicable as there is no

release to wastewater.

Concentration in sewage sludge Not applicable as there is no release to wastewater. mg/kg dwt

EUSES calculation

Local concentration PEC aquatic (local+regional) **Justification**

Fresh water mg/l n 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. 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

Grassland averaged mg/kg dwt 3.75x10-4 **EUSES** calculation 5.91x10-6 Groundwater mg/l Not evaluated. **EUSES** calculation

Local concentration PEC air (local+regional) Justification During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m³ 0 6.87x10-13 **EUSES** calculation Annual deposition mg/m²/d **EUSES** calculation Not evaluated. **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 Total release for regional **Justification**

(local exposure estimation) kg/ exposure estimation kg/day day

Waste water 0.022 737 **EUSES** calculation Surface water Not evaluated. **EUSES** calculation air (direct + STP) 1.10x10-5 **EUSES** calculation 0.231 Soil (direct releases only) Not evaluated. 6.94 Not applicable.

Value Justification

7.96x10-3 **EUSES** calculation Concentration in sewage (PECstp) mg/l

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 195/279

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	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.

Total release for regional

exposure estimation kg/day

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		
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
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	7.07x10-13	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

Justification

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

EUSES calculation Annual deposition mg/m²/d 9.90x10-14 Not evaluated.

PEC aquatic (local+regional) **Justification Local concentration** 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

Inhalable

Inhalable

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

> 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. 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, 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 otherwise indicated. The PROC with the highest exposure level is given since the

Not applicable.

exposure estimates for other PROC are

below this value

Section 3.2 Workers - Exposure estimation

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

Not applicable

Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to

Not applicable. 0.21 **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. 0.15

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

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

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. 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 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 Since the substance is not classified for Not applicable. acute effects and therefore, no acute DNEL has been derived. 0.30 Short term exposure, Local, 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 4: Guidance to check compliance with the exposure scenario

Environment Not available. Not available. Health

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

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05,



Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition UVCB

Pentaethylenehexamine. PEHA **Product name**

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

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 4840 Fraction of Regional tonnage used locally 20% 967 Annual site tonnage 2649 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

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% - 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

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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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Conditions and measures related to municipal sewage treatment plant:

Organisational measures to prevent/limit release from site:

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 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 1860 Fraction of Regional tonnage used locally 372 **Annual site tonnage** Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Continuous release 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 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Not applicable.

20%

1240

Not available.

300

1300

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.

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

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:

Not available. Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

Not available.

300

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 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 2.1 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 Not available. Regional use tonnage 100 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 20.1 Average Local Daily Tonnage (kg/day): 55.1 Maximum daily site tonnage 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 1.00x10-5 RMM) Release fraction to soil from process (initial release prior to 1.00x10-4 RMM) Release fraction to wastewater from process (initial release 0.02 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. Release fraction to wastewater from wide dispersive use Not available. 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%. Treat on-site wastewater (prior to receiving water discharge) =>27.7

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 2.1 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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019 Maximum daily site tonnage 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 RMM) Release fraction to soil from process (initial release prior to 5.00x10-3 RMM) Release fraction to wastewater from process (initial release 0.01 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. 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:

narges, 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

Polesco Category: EPC01, EPC03, EPC04, EPC05

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC08a, ERC08b, ERC08c, ERC08d,

ERC08e, ERC08f, ERC11a 203/279

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:

Not applicable.

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: Spraying outside industrial settings and/or applications

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:

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.

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

Not evaluated.

Not evaluated.

0.027

Release from point source

Total release for regional exposure estimation kg/day **Justification**

Waste water Surface water air (direct + STP) (local exposure estimation) kg/ day

> 0.231 6.94

737

EUSES calculation **EUSES** calculation **EUSES** calculation

Not applicable.

Soil (direct releases only)

Justification Value

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 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

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
	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

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

Annual deposition mg/m²/d 0 Not evaluated. EUSES calculation

Total release for regional

Justification

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/	exposure estimation kg/day	
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.
4			

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)	7.96x10-3	EUSES calculation	

Pentaethylenehexamine, PEHA

mg/l

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 206/279

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.

Section 3.1 Environment - Exposure estimation

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

Release from point source

estimation kg/day	Justification
	EUSES calculation
	EUSES calculation
	EUSES calculation
	Not applicable.
on	
culation	
culation	
ic (local+regional)	Justification
	EUSES calculation
	EUSES calculation
ble.	Not applicable.
nent (local+regional)	Justification
	EUSES calculation
	EUSES calculation
ocal+regional)	Justification
	EUSES calculation
	EUSES calculation
	EUSES calculation
cal+regional)	Justification
ted.	EUSES calculation
	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

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

EUSES calculation Annual deposition mg/m²/d 9.90x10-14 Not evaluated.

PEC aquatic (local+regional) **Justification Local concentration** 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

Long term exposure, Local,

Inhalable

Inhalable

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 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.

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. 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.

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. 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 1: Spraying outside industrial settings and/or applications

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

Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.11 **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

0.30 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 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 208/279 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. 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 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 Since the substance is not classified for Not applicable. acute effects and therefore, no acute DNEL has been derived. 1.22 Short term exposure, Local, 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 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

Pentaethylenehexamine. PEHA **Product name**

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 1860 Fraction of Regional tonnage used locally 20% Annual site tonnage 372 1019 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

Not available.

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% - 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region Not available.

Regional use tonnage 1860 Fraction of Regional tonnage used locally 372 **Annual site tonnage** Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Continuous release 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

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 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not applicable.

20%

1019

Not available.

365

1300

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%.

=>27.7

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% - 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

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: Wood preservative.

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region

2420 Regional use tonnage Fraction of Regional tonnage used locally 20% **Annual site tonnage** 484 Average Local Daily Tonnage (kg/day): 1326

Maximum daily site tonnage

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 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

1000

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.

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

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:

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 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 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 1: Calendering operations

Product characteristics:

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:

Liquid. Covers concentrations up to 2%

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.

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:

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 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.

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

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%

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:

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 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:

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:

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.

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 5: Treatment of articles by dipping and pouring

Product characteristics:

Liquid. Covers concentrations up to 2% Not applicable.

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

Indoor industrial setting 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, 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 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

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be

expected

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)

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 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 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 7: Roller application or brushing of adhesive and other coating

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

Indoor professional 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:

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 3: Exposure estimation

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Release from point source

(local exposure estimation) kg/

Total release for regional exposure estimation kg/day **Justification**

day Waste water

Not evaluated. 5.10x10-6 Not evaluated. 737 n

EUSES calculation **EUSES** calculation **EUSES** calculation

Not applicable.

Value Not applicable as there is no

release to wastewater.

EUSES calculation

Justification

0.231

6.94

Concentration in sewage (PECstp)

mg/l

Surface water

air (direct + STP)

Soil (direct releases only)

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

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.

Total release for regional

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/	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
	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
Pentaethylenehexamine, PEHA		Identified use name: Use of prepa	arations containing ethy

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

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. Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b,

ERC08d, ERC10b

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: 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	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.

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)

Contributing scenarios Dose/Concentration Justification Long term exposure, Systemic,

Route of exposure

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

Long term exposure, Systemic,

Inhalable

Not applicable.

0.61

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

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

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	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.	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 estir			
Contributing scenario controlling wo	orker exposure for 1: Calende	ering operations	
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 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	Since the substance is not classified for acute effects and therefore, no acute DNEL has	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, PROC13, PROC16

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, 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 estimation

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure

Long term exposure, Systemic, **Dermal**

Contributing scenarios

Not applicable.

Dose/Concentration

0.110

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.

0.305

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 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.

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.

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

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

Long term exposure, Systemic, **Dermal**

Contributing scenarios

Not applicable.

Dose/Concentration

0.055

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 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

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	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.	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 esti Contributing scenario controlling wi including weighing) Route of exposure		er of substance or preparation into s	mall containers (dedicated filling line,
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 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, PRO

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, 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 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 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: 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 Long term exposure, Systemic, Not applicable. 0.305 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. 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 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 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. 0.61 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since 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. PROC13.

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.

exposure estimates for other PROC are

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

Contributing scenarios Not applicable. Not applicable.	Dose/Concentration 0.055 0.61	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 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.	0.61	The ECETOC TDA 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.	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 DNI has been derived.
Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived.
Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived.
Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DN has been derived.
Not applicable	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.	Not applicable.
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
imation	andication or bruching of adhesive	and other costing
	Dose/Concentration	Justification
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.	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.	Not applicable.	Not applicable.
Not applicable.	Not applicable.	Not applicable.
	processes with low exposure form - Use of pre Process Category: PROCOS	eparations containing ethylenamines in oper sure potential and evaporation as most likely eparations containing EA up to 2% - Industria 5, PROC06, PROC08a, PROC08b, PROC08 PROC13, PROC1
	Subsec	supplied to that use in form of: In a mixtur Sector of end use: SU03, SU2 quent service life relevant for that use: No ategory: ERC01, ERC04, ERC08a, ERC08b ERC08d, ERC10
	Contributing scenarios Not applicable. Not applicable. Not applicable.	Contributing scenarios Not applicable. Substance see the substance of the

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

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.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic,

Combined

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.

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 Health

Not available.

Not available.

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

Environment Health

Additional Good Practices

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 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 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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 1019 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

Not available.

Not available.

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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region Not available.

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

Maximum daily site tonnage Continuous release 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 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not applicable.

1019

Not available.

365

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%.

=>27.7

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

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: Wood preservative.

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region

2420 Regional use tonnage Fraction of Regional tonnage used locally 20% **Annual site tonnage** 484 Average Local Daily Tonnage (kg/day): 1326

Maximum daily site tonnage 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 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

None.

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.

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

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

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 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 Indoor industrial setting

Other given operational conditions affecting workers

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 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,

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.

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

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 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

Not applicable.

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 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:

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

Other given operational conditions affecting workers

exposure:

Not applicable.

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:

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: Roller application or brushing of adhesive and other coating

Product characteristics:

Liquid. Covers concentrations up to 0.5%

Amounts used:

Not applicable.

Frequency and duration of use:

(source) to prevent release:

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

Not applicable.

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.

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

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:

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.

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.

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:

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

Indoor industrial setting

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 (local exposure estimation) kg/

day

Total release for regional

Justification

Waste water Surface water

Not evaluated. 5.10x10-6 Not evaluated. exposure estimation kg/day 737

EUSES calculation **EUSES** calculation **EUSES** calculation

Not applicable.

Value

Justification

n

0.231

6.94

Concentration in sewage (PECstp)

mg/l

air (direct + STP)

Soil (direct releases only)

Not applicable as there is no

release to wastewater.

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

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 229/279

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.

Total release for regional

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/	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
	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
Pentaethylenehexamine, PEHA		Identified use name: Use of prepare	arations containing ethy

ng 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 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: 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	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 applicable	2.63	EUSES 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	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: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Contributing scenarios Dose/Concentration Justification

Route of exposure

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

Long term exposure, Systemic,

Inhalable

Not applicable.

0.76

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

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, 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
Section 3.2 Workers - Exposure esting the Contributing scenario controlling we		oring operations	
Route of exposure		Dose/Concentration	Justification
•	Contributing scenarios		
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

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.

acute effects and therefore, no acute DNEL

Environmental Release Category: ERC01, ERC04, ERC08a, ERC08b, ERC08d, ERC10b

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 estimation

Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure Not applicable.

Long term exposure, Systemic, **Dermal**

Contributing scenarios

Dose/Concentration 0.027

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.

0.76

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 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. 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.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Inhalable

Short term exposure, Systemic,

Not applicable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Combined

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 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

Long term exposure, Systemic, **Dermal**

Contributing scenarios

Not applicable.

Dose/Concentration 0.027

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 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, 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 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 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

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, 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.

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

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 3.2 Workers - Exposure estil Contributing scenario controlling we		application or brushing of adhes	ive and other coating
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

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,

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		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 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 esti Contributing scenario controlling we expected		naterial as fuel sources, limited	exposure to unburned product to be
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

Not applicable.

Not applicable.

Pentaethylenehexamine, PEHA

Long term exposure, Local, Dermal Not applicable.

Long term exposure, Systemic,

Combined

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

below this value

Not applicable.

Not applicable.

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,

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

ERC08d, ERC10b

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 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. 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, 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 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 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 237/279



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 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	of environmental	exposure
OCCHOIL E. I		oi elivii olillielitai	CADUSUIC

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 1860 Fraction of Regional tonnage used locally 20% **Annual site tonnage** 372 1019 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

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.

Not available.

Not available.

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% - 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region

1860 Regional use tonnage Fraction of Regional tonnage used locally **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage 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 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

20%

Continuous release

365

1300

1000

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%.

=>27.7

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

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 2420
Fraction of Regional tonnage used locally 20%
Annual site tonnage 484
Average Local Daily Tonnage (kg/day): 1326

Maximum daily site tonnage 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

er given operational conditions affecting environmental 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

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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1.00x10-5

1.00710-3

U

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 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

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:

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:

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.

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: Roller application or brushing of adhesive and other coating

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:

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.

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: Fuel additive.

Value

Release from point source (local exposure estimation) kg/

Total release for regional exposure estimation kg/day

Justification

Waste water Surface water air (direct + STP)

Soil (direct releases only)

day 0 Not evaluated. 5.10x10-6 Not evaluated. 737 0 0.231 6.94

EUSES calculation EUSES calculation EUSES calculation Not applicable.

Concentration in sewage (PECstp)

Not applicable as there is no release to wastewater.

EUSES calculation

Justification

mg/l

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, ERC06b,

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

Release from point source

	(local exposure estimation) kg/day	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
	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
Pontanthylonohovamino DEUA		Identified use name: Use of prens	rations containing oth

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

Justification

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 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 2: Wood preservative.

	(local exposure estimation) kg/	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	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.

Total release for 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	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.
Pentaethylenehexamine, PEHA		Identified use name: Use of	of preparations containing ethylenamines in open

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

Justification

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.	0.61	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 esting Contributing scenario controlling we		application or brushing of adhes	ive and other coating
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,	Not applicable	Not applicable.	Since the substance is not classified for

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.

Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

0.61

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

Pentaethylenehexamine, PEHA Identified use name: Use of preparations containing ethylenamines in open

Not applicable.

Short term exposure, Local, Dermal Not applicable

Short term exposure, Local,

Inhalable

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 4: Guidance to check compliance with the exposure scenario

EnvironmentNot available. **Health**Not available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

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,

ERC08d, ERC10b



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 1860 Fraction of Regional tonnage used locally 20% Annual site tonnage 372 1019 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage 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 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

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

Not available.

Not available.

Not available. 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% - 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 1: Use in detergents and cleaners, including professional

Operational conditions: Indoor/Outdoor use

Product characteristics:

Amounts used:

only)

Fraction of EU tonnage used in region

Regional use tonnage 20% Fraction of Regional tonnage used locally **Annual site tonnage** 372 Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

1860

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%.

=>27.7

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

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 2420 Fraction of Regional tonnage used locally 20% 484 Annual site tonnage 1326 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Not available. Continuous release Frequency and duration of use:

Emission Days (days/year) 365

Environment factors not influenced by risk management:

1000 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

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.

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

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

=>27.7

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

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

Liquid. Covers concentrations up to 0.5% **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:

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

Justification

management supervision controls.

Total release for regional

Section 3: Exposure estimation

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	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	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

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 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

	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.

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 2: Wood preservative.

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
Waste water	day	737	EUSES calculation
	0.241	131	
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
	Local concentration	PEC aquatic (I	ocal+regional)

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

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.

			_		
Section 3	2 W	orkers .	. Exnosi	ire estimatio	n

Section 3.2 Workers - Exposure esti Contributing scenario controlling we containers at non-dedicated facilitie	orker exposure for 0: Transfe	er of substance or preparation (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 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

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 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 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: $\ensuremath{\mathsf{No}}$.

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 UVCB

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

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 o	f environmenta	l 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 4840 Fraction of Regional tonnage used locally 20% 967 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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 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)

only)

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

prevent release:

Not applicable.

Not available.

Not available.

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

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:

Fraction of EU tonnage used in region Not available.

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

Maximum daily site tonnage 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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Continuous release

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: 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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region

Regional use tonnage Fraction of Regional tonnage used locally 372 **Annual site tonnage** Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage Frequency and duration of use:

Emission Days (days/year) 300

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

1860

20%

1240

Not available.

Continuous release

1300

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 Not available.

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

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

Maximum daily site tonnage 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

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

Fechnical 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

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

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.

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:

Not available. Fraction of EU tonnage used in region

1860 Regional use tonnage 20% Fraction of Regional tonnage used locally 372 Annual site tonnage Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release

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

exposure:

Release fraction to air from process (initial release prior to

RMM)

None.

0

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

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 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) =>27.7

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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%.

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.

4840 Regional use tonnage Fraction of Regional tonnage used locally 20% **Annual site tonnage** 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage Not available. Continuous release 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 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:

1.00x10-5

Not available.

Not available.

Not available.

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%

Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

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

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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 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

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 professional setting

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: 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

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.

Not applicable.

Indoor professional setting

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

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

Pentaethylenehexamine, PEHA

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

Process Category: PROC21, PROC24

Sector of end use: SU22

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

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Industrial

0	8.15x10-3	EUSES calculation
0	8.02x10-4	EUSES calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.256	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
0	3.75x10-4	EUSES calculation
0	3.75x10-4	EUSES calculation
Not evaluated.	5.91x10-6	EUSES calculation
Local concentration	PEC air (local+regional)	Justification
0	Not evaluated.	EUSES calculation
0	6.87x10-13	EUSES calculation
0	Not evaluated.	EUSES calculation
Local concentration	PEC aquatic (local+regional)	Justification
Not applicable.	Not applicable.	Not applicable.
	0 Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration 0 Not evaluated. Local concentration 0 Not evaluated. Local concentration 0 0 Local concentration	0 8.02x10-4 Not applicable. Not applicable. Local concentration PEC sediment (local+regional) Not evaluated. 2.61 Not evaluated. 0.256 Local concentration PEC soil (local+regional) 0 3.75x10-4 Not evaluated. 5.91x10-6 Local concentration PEC air (local+regional) 0 Not evaluated. 0 6.87x10-13 0 Not evaluated. Local concentration PEC aquatic (local+regional)

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.

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 260/279

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
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

Not applicable.

	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 ⁻⁴	EUSES calculation

Not applicable.

Pentaethylenehexamine, PEHA

Intermittent release. mg/l

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

Not applicable.

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 Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 2.61 0.256	Justification EUSES calculation 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.

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 ⁻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	Table R16.23[REACH]
	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.

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

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 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 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 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.	0.12	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 esting Contributing scenario controlling work articles		nechanical) energy work-up of s	ubstances bound in materials and/or
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

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.

Not applicable.

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Pentaethylenehexamine, PEHA

Long term exposure, Systemic,

Long term exposure, Local,

Long term exposure, Local, Dermal

Combined

Inhalable

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% -

Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

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

Short term exposure, Systemic,

Short term exposure, Systemic,

Dermal

Inhalable

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, Systemic,

Short term exposure, Local, Dermal Not applicable.

Combined

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.

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 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)

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: 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: Operational conditions and risk management measures

Section 2.1	Control	of env	ironmental	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 4840 Fraction of Regional tonnage used locally 20% 967 **Annual site tonnage** Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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 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)

only)

Not available. 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 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

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.

Not applicable.

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

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Pentaethylenehexamine, PEHA

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

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:

Fraction of EU tonnage used in region Not available.

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

Maximum daily site tonnage Not available. 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 air from wide dispersive use (regional

only)

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

to provide the required removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

Continuous release

1.00x10-5

Not available.

Not available.

Not available.

Not applicable.

300

Release fraction to wastewater from process (initial release

prior to RMM)

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use

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

Not available.

No wastewater treatment required.

Pentaethylenehexamine, PEHA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - 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%.

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 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region

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

Maximum daily site tonnage 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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

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

plant:

Not available.

20%

Not available.

300

1300

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 Not available.

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

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

Maximum daily site tonnage 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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use Fechnical 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

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

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:

Not available. Fraction of EU tonnage used in region

1860 Regional use tonnage 20% Fraction of Regional tonnage used locally 372 Annual site tonnage Average Local Daily Tonnage (kg/day): 1019

Maximum daily site tonnage Not available. Frequency and duration of use: Continuous release

365 **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)

0

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

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 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) =>27.7 to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

0.01

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%.

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:

Amounts used:

Fraction of EU tonnage used in region Not available.

4840 Regional use tonnage Fraction of Regional tonnage used locally **Annual site tonnage** 967 Average Local Daily Tonnage (kg/day): 2649

Maximum daily site tonnage 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

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:

Not applicable.

20%

Continuous release

None.

1.00x10-5

Not available.

Not available.

Not available.

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% -Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC06d

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

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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 professional setting

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: High (mechanical) energy work-up of substances bound in materials and/or articles

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:

Solid. Covers concentrations up to 2%

Not applicable.

Not applicable.

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

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: 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
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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

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 271/279

0	8.15x10-3	EUSES calculation
0	8.02x10-4	EUSES calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	2.61	EUSES calculation
Not evaluated.	0.256	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
0	3.75x10-4	EUSES calculation
0	3.75x10-4	EUSES calculation
Not evaluated.	5.91x10-6	EUSES calculation
Local concentration	PEC air (local+regional)	Justification
0	Not evaluated.	EUSES calculation
0	6.87x10-13	EUSES calculation
0	Not evaluated.	EUSES calculation
Local concentration	PEC aquatic (local+regional)	Justification
Not applicable.	Not applicable.	Not applicable.
	0 Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration 0 Not evaluated. Local concentration 0 Local concentration 0 Local concentration	Not applicable. Not applicable. Not applicable. Not applicable. PEC sediment (local+regional) Not evaluated. Not evaluated. Decal concentration Not evaluated. Not evaluated. Not evaluated. PEC soil (local+regional) Not evaluated. Not evaluated. Sequence in the period of the period

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.

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

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
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
1			

Not applicable.

8.02x10⁻⁴

Not applicable.

Section 3.1 Environment - Exposure estimation

Micro-organism mg/l

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

Not applicable.

Not applicable.

	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

Pentaethylenehexamine, PEHA

Marine water mg/l

Intermittent release. mg/l

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

EUSES calculation

Not applicable.

Not applicable.

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

Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 2.61 0.256	Justification EUSES calculation 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.

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 ⁻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	Table R16.23 [REACH]
	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.

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 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 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 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 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.	0.03	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 esting	mation		
Contributing scenario controlling we articles	orker exposure for 1: High (m	nechanical) energy work-up of s	ubstances bound in materials and/or
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, 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 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

Pentaethylenehexamine, PEHA

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

has been derived.

. Industrial

Process Category: PROC21, PROC24

Sector of end use: SU22

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

Short term exposure, Systemic, Not applicable Not applicable. **Dermal**

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.

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

0.03

acute effects and therefore, no acute DNEL

has been derived.

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 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 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

Regional use tonnage

Fraction of Regional tonnage used locally

Annual site tonnage

Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage

Not available.

Not available.

Not available.

Frequency and duration of use:

Emission Days (days/year) Not available.

Environment factors not influenced by risk management:

Local freshwater dilution factorNot available.Local marine water dilution factorNot available.

Other given operational conditions affecting environmental

exposure:

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

Not available.

Release fraction to soil from process (initial release prior to

Not available.

RMM)

Not available.

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

Not available.

Release fraction to air from wide dispersive use (regional

...

Release fraction to soil from wide dispersive use (regional

only)

Not available.

Release fraction to wastewater from wide dispersive use

Not available.

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

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

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

Treat air emission to provide a typical removal efficiency of Not available.

Treat on-site wastewater (prior to receiving water discharge) Not available.

to provide the required removal efficiency of

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of

Not available.

Total release for regional

Conditions and measures related to municipal sewage treatment plant:

Section 2.2 Control of worker exposure

Contributing scenario controlling worker exposure for 0:

Section 3: Exposure estimation

Section 3.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0:

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
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.

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,

Justification

ERC08e, ERC08f, ERC11a

Section 3.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 0: Route of exposure **Dose/Concentration Justification Contributing scenarios** Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable 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. Not applicable. Inhalable Not applicable. Short term exposure, Systemic, Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Not applicable. Not applicable. Not applicable. Short term exposure, Systemic, Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable

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.

279/279

Identified use name: Use of ethylenamines in open processes with high