## SAFETY DATA SHEET



Tetraethylenepentamine, TEPA

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

1.1 Product identifier

Product name : Tetraethylenepentamine, TEPA

 Index number
 : 612-065-00-8

 EC number
 : 292-587-7

**REACH Registration number** 

Registration number	Legal entity
01-2119487290-37-0000	Delamine BV

CAS number : 90640-66-7

Product description : Not applicable

Product type : Liquid.

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

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

Intermediate. Lubricants and additives Pharmaceuticals. Surface-active agents

Area of application : Industrial applications.

#### 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 : Multi-constituent substance

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

Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411

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

Xn; R21/22 C; R34 R43 N; R51/53

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

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## **SECTION 2: Hazards identification**

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

#### 2.2 Label elements

**Hazard pictograms** 







Signal word

**Hazard statements** : Harmful if swallowed or in contact with skin. Causes severe skin burns and eve damage.

May cause an allergic skin reaction.

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.

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

> for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water

or shower. Immediately call a POISON CENTER or physician. IF IN EYES:

Immediately call a POISON CENTER or physician.

: Store locked up. **Storage** 

Dispose of contents and container in accordance with all local, regional, national and **Disposal** 

international regulations.

**Hazardous ingredients** : Amines, polyethylenepoly-, tetraethylenepentamine fraction

Supplemental label

elements

: Not applicable.

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

: Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant

fastenings

: Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

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

: No.

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

: **N**o

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

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

Substance/mixture

: Multi-constituent substance

			<u>Classification</u>		
Product/ingredient name	Identifiers	%	67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	Туре
Mines, polyethylenepoly-, tetraethylenepentamine fraction	REACH #: 01-2119487290-37 EC: 292-587-7 CAS: 90640-66-7 Index: 612-065-00-8	100	Xn; R21/22 C; R34 R43 N; R51/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[*]
3,6, 9-triazaundecamethylenediamine	EC: 203-986-2 CAS: 112-57-2 Index: 612-060-00-0	30 - 70	Xn; R21/22 C; R34 R43 N; R51/53	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]
3, 6-diazaoctanethylenediamin	EC: 203-950-6 CAS: 112-24-3 Index: 612-059-00-5	0 - 3	Xn; R21 C; R34 R43 R52/53	Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	[B]
			See Section 16 for the full text of the R- phrases declared above.	See Section 16 for the full text of the H statements declared above.	

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

#### **Type**

- [\*] Substance
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

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

#### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

**Eye contact** 

: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation

: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

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

#### Skin contact

: Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

#### Ingestion

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

**Eve contact** 

: Causes serious eye damage.

Inhalation

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

Skin contact

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

Ingestion

Farmful if swallowed. Corrosive to the digestive tract. Causes burns. May cause burns to mouth, throat and stomach.

#### Over-exposure signs/symptoms

**Eye contact** 

: Adverse symptoms may include the following:

pain watering redness

Inhalation

: No specific data.

**Skin contact** 

: Adverse symptoms may include the following:

pain or irritation

redness

blistering may occur

Ingestion

: Adverse symptoms may include the following:

stomach pains

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

Notes to physician

: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments** 

: No specific treatment.

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## **SECTION 5: Firefighting measures**

#### 5.1 Extinguishing media

Suitable extinguishing media

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

Unsuitable extinguishing media

: Halones

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

Hazards from the substance or mixture

: In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products

: Decomposition products may include the following materials: carbon dioxide carbon monoxide

#### 5.3 Advice for firefighters

Special protective actions for fire-fighters

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

Special protective equipment for fire-fighters

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

## SECTION 6: Accidental release measures

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

nitrogen oxides

For non-emergency personnel

: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

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

## 6.2 Environmental precautions

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

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

**Small spill** 

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

Large spill

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

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#### SECTION 6: Accidental release measures

#### 6.4 Reference to other sections

: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment.

See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

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

#### 7.1 Precautions for safe handling

#### **Protective measures**

: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

#### Advice on general occupational hygiene

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

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

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

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

#### **Danger criteria**

	Notification and MAPP threshold	Safety report threshold
<ul><li></li></ul>	200 200	500 500

#### 7.3 Specific end use(s)

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

solutions

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

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

#### 8.1 Control parameters

#### Occupational exposure limits

No exposure limit value known.

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

Recommended monitoring procedures

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

#### **DNELs/DMELs**

Product/ingredient name	Type	Exposure	Value	Population	Effects
Amines, polyethylenepoly-, tetraethylenepentamine fraction	DNEL	Short term Inhalation	6940 mg/ m³	Workers	Systemic
	DNEL	Long term Dermal	0.74 mg/ kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	1.29 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	0.036 mg/ cm <sup>2</sup>	Workers	Local
	DNEL	Short term Dermal	10 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Inhalation	2071 mg/ m³	Consumers	Systemic
	DNEL	Short term Oral	26 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Dermal	1.29 mg/ cm <sup>2</sup>	Consumers	Local
	DNEL	Long term Dermal	0.32 mg/ kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	0.38 mg/m <sup>3</sup>	Consumers	Systemic
	DNEL	Long term Oral	0.53 mg/ kg bw/day	Consumers	Systemic
	DNEL	Long term Dermal	0.56 mg/ cm <sup>2</sup>	Consumers	Local

#### **PNECs**

Product/ingredient name	Compartment Detail	Value	Method Detail
Amines, polyethylenepoly-, tetraethylenepentamine fraction	Fresh water	6.8 µg/l	Assessment Factors
,	Marine	6.8 µg/l	Assessment Factors
	Fresh water sediment	0.341 mg/kg dwt	-
	Marine water sediment	0.187 mg/kg dwt	-
	Soil	0.683 mg/kg dwt	-
	Sewage Treatment	4.6 mg/l	Assessment Factors
	Plant		
	Secondary Poisoning	0.23 mg/kg	Assessment Factors

#### 8.2 Exposure controls

Appropriate engineering controls

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

**Individual protection measures** 

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

#### **Hygiene measures**

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

#### **Eye/face protection**

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

#### **Skin protection**

#### **Hand protection**

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): neoprene

#### **Body protection**

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

#### Other skin protection

: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: neoprene Boots.

#### **Respiratory protection**

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: ammonia filter (Type K) ammonia (Type K) and particulate filter

## **Environmental exposure** controls

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.

Colour : Off-white. Clear.

Odour : Odourless.

Odour threshold : Not available.

**pH** : 13.5

**Melting point/freezing point** : -40°C Pour point < -20 C

Initial boiling point and boiling : 375°C

range

Flash point : Closed cup: 177°C

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Burning time : Not applicable.

Burning rate : Not applicable.

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## SECTION 9: Physical and chemical properties

Upper/lower flammability or

explosive limits

Not available.

: <0.001 kPa [room temperature] Vapour pressure

Vapour density : 6.5 [Air = 1] : Not available. Relative density : Not available. Solubility(ies) Solubility in water : >1000 g/l

Partition coefficient: n-octanol/ : -3.16

water

**Auto-ignition temperature** 

: 330°C

**Decomposition temperature** 

: Not available.

**Viscosity** 

Dynamic (room temperature): 80 mPa·s

**Explosive properties** 

: Not available.

**Oxidising properties** 

: None.

9.2 Other information

**Density** Physical/chemical properties : 0.991 to 0.999 g/cm³ [20°C] : No additional information.

comments

## SECTION 10: Stability and reactivity

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

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions

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

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

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

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

Chlorinated hydrocarbon.

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

## SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects

#### **Acute toxicity**

Product/ingredient name	Result	Species	Dose	Exposure
Amines, polyethylenepoly-, tetraethylenepentamine fraction	LD50 Dermal	Rabbit	1260 mg/kg	-
	LD50 Oral	Rat	3250 mg/kg	-

**Conclusion/Summary** 

: Inhalation No applicable toxicity data Cannot be classified.

Oral No additional information. Dermal No additional information.

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

Tetraethylenepentamine, TEPA

## **SECTION 11: Toxicological information**

#### **Irritation/Corrosion**

**Conclusion/Summary** 

Skin : Corrosive to the skin.

Eyes : Corrosive to eyes.

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

applicable.

#### **Sensitisation**

Product/ingredient name	Route of exposure	Species	Result
Amines, polyethylenepoly-, tetraethylenepentamine fraction	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
Amines, polyethylenepoly-, tetraethylenepentamine fraction	-	Experiment: In vivo Subject: Mammalian-Animal	Negative

**Conclusion/Summary** 

: No mutagenic effect.

**Carcinogenicity** 

**Conclusion/Summary** 

: skin No carcinogenic effect.

**Reproductive toxicity** 

**Conclusion/Summary** 

: Fertility No data available for this end-point, hence this classification is not considered

to be applicable.

Developmental Toxicity: Data inconclusive. Cannot be classified. NOAEL Oral= 970

mg/kg bw/day NOAEL Dermal=161 mg/kg bw/day

For developmental effects, read-across from TETA has been proposed. TETA is currently under investigation because of effects seen in an animal study with high

doses of a related salt.

**Teratogenicity** 

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

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

#### **Aspiration hazard**

Not available.

Information on the likely routes of exposure

: Routes of entry anticipated: Oral.

Potential acute health effects

**Eye contact** : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory

system. Exposure to decomposition products may cause a health hazard. Serious

effects may be delayed following exposure.

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## **SECTION 11: Toxicological information**

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. May cause

burns to mouth, throat and stomach.

#### 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 : No specific data.

effects

. 140 opcome 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
Amines, polyethylenepoly-, tetraethylenepentamine fraction	Sub-chronic LOAEL Oral	Rat	43 mg/kg	26 weeks
	Sub-chronic NOAEL Dermal	Rabbit	50 mg/kg	31 days

Conclusion/Summary : No known significant effects or critical hazards. Not classified as dangerous

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

very low levels.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

No known significant effects or critical hazards.

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

Other information : No specific data.

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## **SECTION 12: Ecological information**

#### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Amines, polyethylenepoly-, tetraethylenepentamine fraction	EC50 97.3 mg/l	Micro-organism	2 hours
	NOEC 46 mg/l Acute EC50 6.8 mg/l Acute EC50 24.1 mg/l Acute LC50 420 mg/l Acute NOEC 0.5 mg/l	Micro-organism Algae Daphnia Fish Algae	- 72 hours 48 hours 96 hours -

**Conclusion/Summary** 

: Dangerous for the environment. PNEC Intermittent release.= 0.068 mg/l

#### 12.2 Persistence and degradability

**Conclusion/Summary** 

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

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Amines, polyethylenepoly-, tetraethylenepentamine fraction	-	-	Not readily

#### 12.3 Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
Amines, polyethylenepoly-, tetraethylenepentamine fraction	-3.16	-	low

#### 12.4 Mobility in soil

Soil/water partition coefficient (Koc)

: 4000

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.

## **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** 

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## **SECTION 13: Disposal considerations**

**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	UN2320	UN2320	UN2320	UN2320
14.2 UN proper shipping name	TETRAETHYLENEPENTAMINE	TETRAETHYLENEPENTAMINE	TETRAETHYLENEPENTAMINE.  Marine pollutant (Tetraethylenepentamine)	Tetraethylenepentamine
14.3 Transport hazard class(es)	8	8	8	8
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	₩o.
Additional information	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.  Hazard identification number 80  Limited quantity 5 L  Tunnel code (E)	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.  Emergency schedules (EmS) F-A, S-B	The environmentally hazardous substance mark may appear if required by other transportation regulations.  Passenger and Cargo Aircraft Quantity limitation: 5 L Packaging instructions: 852 Cargo Aircraft Only Quantity limitation: 60 L Packaging instructions: 856 Limited Quantities - Passenger Aircraft Quantity limitation: 1 L Packaging instructions: Y841  Special provisions

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

SECTION 14: Transport information

A803

14.6 Special precautions for

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

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

: Not available.

## **SECTION 15: Regulatory information**

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

Annex XIV - List of substances subject to authorisation

**Substances of very high concern** 

None of the components are listed.

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

: Not applicable.

articles
Other EU regulations

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

**Seveso II Directive** 

This product is controlled under the Seveso II Directive.

**Danger criteria** 

**Category** 

2: Hazardous to the aquatic environment - Chronic 2

C9ii: 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.

1272/2008]

DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level

EUH statement = CLP-specific Hazard statement PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RRN = REACH Registration Number

vPvB = Very Persistent and Very Bioaccumulative

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## **SECTION 16: Other information**

Key literature references and sources for data

: Regulation (EC) No. 1272/2008 [CLP]; European convention concerning international road transport of dangerous goods (ADR) done in Geneva on September 30, 1957 (Dz. U. no. 35/1975, pos. 189) plus amendments; Regulation for the transport of dangerous materials on the Rhine (ADN); Occupational exposure limits; International regulations

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

Procedure used to derive the	e classification according to h	Regulation (EC) No. 1212/2006 [CLP/GH5]
Classi	fication	Justification
Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411		Expert judgment
Full text of abbreviated H statements	H317 May cause an alle H318 Causes serious e H411 Toxic to aquatic li	ct with skin. kin burns and eye damage. ergic skin reaction.
Full text of classifications [CLP/GHS]	Acute Tox. 4, H312 Aquatic Chronic 2, H411 Aquatic Chronic 3, H412 Eye Dam. 1, H318 Skin Corr. 1A, H314 Skin Corr. 1B, H314	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 4 LONG-TERM AQUATIC HAZARD - Category 2 LONG-TERM AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SKIN CORROSION/IRRITATION - Category 1A SKIN CORROSION/IRRITATION - Category 1B SKIN SENSITIZATION - Category 1
Full text of abbreviated R phrases	R34- Causes burns. R43- May cause sensitisati R51/53- Toxic to aquatic or aquatic environment.	t with skin and if swallowed.
Full text of classifications [DSD/DPD]	: C - Corrosive Xn - Harmful N - Dangerous for the envi	ronment
Training advice Date of issue/ Date of revision	<ul><li>: Ensure operatives are train</li><li>: 15/04/2014</li></ul>	ned to minimise exposures. Training staff on good practice.

Date of previous issue : 07/09/2012

Version : 6

#### **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** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

**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:

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day) 1274

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

Emission Days (days/year): 365

Environment factors not influenced by risk

management:

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

Other given operational conditions affecting

environmental exposure:

Release fraction to air from process (initial release prior 0

to RMM):

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

prior to RMM):

Release fraction to wastewater from process (initial 0.01

release prior to RMM):

Conditions and measures related to municipal sewage

treatment plant:

Estimated substance removal from wastewater via on-Not available

site sewage treatment (%):

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

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

Maximum allowable site tonnage (Msafe) based on

release following total wastewater treatment removal

(kg/d):

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

Not available.

Not available.

Tetraethylenepentamine, TEPA

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 0:

**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 q
- Covers exposure up to 5 minutes/event

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

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

Operations Conditions (consumer):

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

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

Total release for regional

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

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

Contributing scenario controlling environmental exposure for 0:

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.010	19.2	<b>EUSES</b> calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
Marine water mg/l	3.17x10-6	4.66x10-5	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.	0.222	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation

Release from point source

Tetraethylenepentamine, TEPA

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,

**Justification** 

ERC08e, ERC08f

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

**Local concentration** PEC soil (local+regional) Justification EUSES calculation Agricultural soil averaged mg/kg 2 00x10-12 0.077 Grassland averaged mg/kg dwt 3.96x10-12 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation PEC air (local+regional) Local concentration **Justification** Not evaluated. During emission mg/m³ 7 96x10-14 **EUSES** calculation 3.94x10-10 Annual average mg/m<sup>3</sup> 7 96x10-14 **EUSES** calculation Annual deposition mg/m²/d 1 69x10-13 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2 Exposure estimation - Consumers

Exposure estimation and reference to its source - Consumers: 2:

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

Scenario: substance in the

article::

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

Mixing and loading; reference to its source -Adhesives, sealants -Consumers: 0: 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: 1:

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

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

(Long term exposure):

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

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

(Update model): Scenario Molecular

weight (g/mole): 32.9

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

Dermal:

**Application methods:** instant

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

area) cm2: model):

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

Inhalation mg/m<sup>3</sup> Dermal load (mg/cm2): Dermal External dose (mg/kg Dermal (Internal dose) mg/kg bw/day: (Concentration on day of

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

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

Tetraethylenepentamine, TEPA

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

Contributing scenario controlling co	nsumer exposure for 3:		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable		Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Oral	Not applicable.	Not applicable.	Not applicable.

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

Environment	Not available.	
Health	Not available.	

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

Environment	Not applicable.
Health	Not applicable.
Additional guidance	Not applicable.



**Professional** 

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

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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: ERC11a

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

Section 2.1: Control of environ	imentai exposure
---------------------------------	------------------

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 4033 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

plant:

Not available.

300

1000

7.36x10-4

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.

Tetraethylenepentamine, TEPA

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: ERC11a

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

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

Environment factors not influenced by risk management:

Local marine water dilution factor: 1000 None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

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

plant:

Not applicable

Not available.

Not available

Emission Days (days/year): 220

1000 Local freshwater dilution factor:

Other given operational conditions affecting environmental

7.36x10-4

Not available

Not available.

Not available.

Not applicable.

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

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

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114

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

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

Environment factors not influenced by risk management:

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

exposure:

Tetraethylenepentamine, TEPA

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: ERC11a

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

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

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

300 Emission Days (days/year):

Environment factors not influenced by risk management:

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

RMM):

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

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

Release fraction to soil from wide dispersive use (regional

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

186

Continuous release.

5.00x10-4

1.00x10-2

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

Tetraethylenepentamine, TEPA

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: 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 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Emission Days (days/year):

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

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

Environment factors not influenced by risk management:

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

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

If discharging to domestic sewage treatment plant, provide

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

Conditions and measures related to municipal sewage treatment

plant:

1000

7.36x10-4

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%.

=>37.4

Organisational measures to prevent/limit release from site:

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% 232 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 773

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

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Tetraethylenepentamine, TEPA

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: ERC11a

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

exposure:

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

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

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

Release fraction to air from wide dispersive use (regional

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

7 36x10-4

1.00x10-3

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%.

=>37 4

Not available

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): 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

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of (%):

Not available.

Not available

220

None

7.36x10-4

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%.

Tetraethylenepentamine, TEPA

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: ERC11a

Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%):

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

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

Release fraction to air from process (initial release prior to

exposure:

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

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

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

5580

1000

7.36x10-4

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 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally:

465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Not available

Tetraethylenepentamine, TEPA

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: ERC11a

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

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: Not available

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

None

365

5.00x10-3

0.01

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%.

=>37.4

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 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

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

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

management supervision controls.

#### 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

Indoor, professional setting

**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:

Not applicable.

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

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Tetraethylenepentamine, TEPA

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: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not applicable	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation 0 3.94x10-10 **EUSES** calculation Annual average mg/m³ 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

#### 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	<b>EUSES</b> calculation
Annual average mg/m³	1.24x10-10	0.077	<b>EUSES</b> calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	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: Metal working fluids

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	<b>EUSES</b> calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	

Tetraethylenepentamine, TEPA

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

**Justification** 

Total release for regional

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC11a

Concentration in sewage (PECstp) 0.121 **EUSES** calculation Concentration in sewage sludge 183 **EUSES** calculation mg/kg dwt Local concentration PEC aquatic (local+regional) Justification Fresh water mg/l 1.20x10-4 5.58x10-4 **EUSES** calculation Marine water mg/l 1.92x10-4 2.36x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.282 Marine water sediment mg/kg dwt Not evaluated. 0.119 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation PEC air (local+regional) Local concentration **Justification** During emission mg/m<sup>3</sup> 7.93x10-6 Not evaluated. **EUSES** calculation 6.52x10-6 6.52x10-6 Annual average mg/m<sup>3</sup> **EUSES** calculation Annual deposition mg/m²/d 1.38x10-5 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration** Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.68x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: Use of coatings and adhesives

Release from point source

(local exposure estimation) kg/

	day		
Waste water	0.010	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
Marine water mg/l	3.17x10-6	4.66x10-5	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	0.222	EUSES calculation
Marine water sediment mg/kg dwt	Not applicable	0.024	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	2.00x10-12	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10-12	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification

Tetraethylenepentamine, TEPA

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

**Justification** 

Professional

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC11a

During emission mg/m<sup>3</sup> 7.96x10-14 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 7.96x10-14 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d 1.69x10-13 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 -	<ul> <li>Exposure</li> </ul>	estimation
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Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

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

Route of exposure

**Dermal** 

**Justification** 

estimate workplace 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** 

0.06

**Dose/Concentration** 

The ECETOC TRA tool has been used to estimate workplace 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 evaluated. Not evaluated. Not applicable.

Not applicable.

Not applicable. Not applicable Not applicable.

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

has been derived.

Short term exposure, Systemic,

**Dermal** 

Not applicable

Not applicable.

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

has been derived.

Short term exposure, Systemic, Inhalable

Not applicable

Not applicable.

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

has been derived

Short term exposure, Systemic, Combined

Not applicable

Not applicable.

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

has been derived.

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

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

has been derived.

Short term exposure, Local, Inhalable

Not applicable.

0.12

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

**Route of exposure Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, Not applicable 0.001 **Dermal** 

The ECETOC TRA tool has been used to estimate workplace 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 Not applicable.

Not applicable.

Not applicable.

Long term exposure, Systemic,

Combined

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

Inhalable Short term exposure, Systemic,

Dermal Short term exposure, Systemic, Inhalable

Not applicable.

Not applicable.

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable. Not applicable.

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

Tetraethylenepentamine, TEPA

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: ERC11a

Short term exposure, Systemic, Combined

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

Inhalable

Not applicable.

Not applicable. 0.12

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.



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

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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: ERC11a

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

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 4033 Average Local Daily Tonnage (kg/day):

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

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

plant:

Not available

300

7.36x10-4

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.

Tetraethylenepentamine, TEPA

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: ERC11a

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

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

Emission Days (days/year): 220

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 7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

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

Technical conditions and measures at process level (source) to

prevent release:

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Not available

None.

Not available

Not available.

Not applicable.

No wastewater treatment required.

#### Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114

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

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

Environment factors not influenced by risk management:

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

exposure:

Tetraethylenepentamine, TEPA

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: ERC11a

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

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

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

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

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

300 Emission Days (days/year):

Environment factors not influenced by risk management:

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

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:

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

5.00x10-4

1.00x10-2

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

Tetraethylenepentamine, TEPA

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: 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 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

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

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

Conditions and measures related to municipal sewage treatment

Not available.

None.

7.36x10-4

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%.

=>37.4

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

Organisational measures to prevent/limit release from site:

plant:

Not available.

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Section 2.1: Control of environmental exposure

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% 232 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 773

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

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Tetraethylenepentamine, TEPA

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

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

exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment 7.36x10-4

1.00x10-3

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%.

=>37 4

Not available

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

plant:

prevent release:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

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

220 Emission Days (days/year):

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 7.36x10-4 RMM):

Release fraction to soil from process (initial release prior to

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

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

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

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

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

Treat air emission to provide a typical removal efficiency of (%):

4840

Continuous release.

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%.

Tetraethylenepentamine, TEPA

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: ERC11a

Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 5580 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

exposure:

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

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

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

Release fraction to air from wide dispersive use (regional

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

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Not available.

1000

7.36x10-4

Not available.

Not available.

Not available

Not applicable.

Not available.

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

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

No wastewater treatment required.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274 Maximum daily site tonnage (kg/day): Not available

Tetraethylenepentamine, TEPA

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: ERC11a

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 None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1000

365

5.00x10-3

0.01

Not available

Not available.

Not applicable.

Not available.

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

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

=>37.4

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 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: **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.

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

Indoor, professional setting

**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:

Not applicable.

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Tetraethylenepentamine, TEPA

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: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation

Tetraethylenepentamine, TEPA

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

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** 0 Not evaluated. **EUSES** calculation During emission mg/m³ 0 3.94x10-10 **EUSES** calculation Annual average mg/m³ 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

## 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not applicable	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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

Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	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: Metal working fluids

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	

Tetraethylenepentamine, TEPA

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

Concentration in sewage (PECstp) 0.121 **EUSES** calculation Concentration in sewage sludge 183 **EUSES** calculation mg/kg dwt Local concentration PEC aquatic (local+regional) Justification Fresh water mg/l 1.20x10-4 5.58x10-4 **EUSES** calculation Marine water mg/l 1.92x10-4 2.36x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.282 Marine water sediment mg/kg dwt Not evaluated. 0.119 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification **EUSES** calculation Agricultural soil averaged mg/kg 1.64x10-4 0.077 Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation PEC air (local+regional) Local concentration **Justification** During emission mg/m<sup>3</sup> 7.93x10-6 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 6.52x10-6 6.52x10-6 **EUSES** calculation Annual deposition mg/m²/d 1.38x10-5 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) Justification **Local concentration** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: Use of coatings and adhesives

Release from point source

(local exposure estimation) kg/

	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10-12	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	2.00x10-12	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.222	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	3.17x10-6	4.66x10-5	EUSES calculation
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
air (direct + STP)	0	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	0.010	19.2	EUSES calculation

Tetraethylenepentamine, TEPA

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

During emission mg/m<sup>3</sup> 7.96x10<sup>-14</sup> Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 7.96x10<sup>-14</sup> 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d 1.69x10-13 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Not applicable. Micro-organism mg/l Not applicable. Not applicable.

Section 3:.2 Workers - Exposure estimation

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

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

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

0.02 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.

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

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.

0.03

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 estimation

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

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

Long term exposure, Systemic,

**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 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, Not applicable

Dermal

Not applicable.

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

has been derived.

Tetraethylenepentamine, TEPA

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: ERC11a

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.

0.03

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 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.



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

Industrial

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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

Sectio	n 2.1	: 0	Conti	rol	of	env	ror	ımen	ta	exposure
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Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 4650 Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

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

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor:

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of (%):

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

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

=>37.4

Indoor. industrial setting

7 36x10-4

1.00x10-4

4.84x10-8

Not available.

Not available.

Not available.

Not applicable.

Not available.

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

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

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

wastewater

Tetraethylenepentamine, TEPA

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

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

Substance supplied to that use in form of: As such Sector of end use: SU03

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

Conditions and measures related to municipal sewage treatment plant:

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year):

Fraction of Regional tonnage used locally:

Annual site tonnage (tonnes/year):

Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day):

Not available.

Frequency and duration of use:

Not available.

Continuous release.

Emission Days (days/year): 300

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

Local freshwater dilution factor: 1000

Local marine water dilution factor: Not applicable.

7.36x10-4

1.00x10-4

4.84x10-8

Not available

Not available.

Not available.

=>37 4

Not available

wastewater

2000

Not applicable.

Other given operational conditions affecting environmental Indoor, industrial setting

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

lant:

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 9300
Fraction of Regional tonnage used locally: 25%
Annual site tonnage (tonnes/year): 2320
Average Local Daily Tonnage (kg/day): 10300
Maximum daily site tonnage (kg/day): Not available.

Tetraethylenepentamine, TEPA

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

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

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

Prevent discharge of undissolved substance to or recover from onsite

Industrial

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

PROC08a, PROC08b, PROC09, PROC15 Substance supplied to that use in form of: As such

Sector of end use: SU03 Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC06a

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: 2.0x10 6 m<sup>3</sup>/d

Local marine water dilution factor: 1000

Indoor. industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

225

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 applicable as there is no release to

wastewater Not available.

### Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

4840 Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 21500 Average Local Daily Tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 225

Environment factors not influenced by risk management:

Maximum daily site tonnage (kg/day):

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 RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Tetraethylenepentamine, TEPA

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:

7.36x10-4

Indoor, industrial setting

Not available.

5.00x10-5

Not available.

Not available

Not available

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

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

PROC08a, PROC08b, PROC09, PROC15

Substance supplied to that use in form of: As such Sector of end use: SU03

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

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

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

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%.

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

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

Not available.

=>37.4

Not applicable.

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:

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

Section 2.2: Control of worker exposure

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

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

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

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:

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

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

Amounts used: Not applicable.

Frequency and duration of use: Do not carry 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, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

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

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

Amounts used: Not applicable

Frequency and duration of use: Continuous release.

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%

Tetraethylenepentamine, TEPA

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

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Industrial

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

**Personal protection:** 

Not applicable.

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

### Section 2.2: Control of worker exposure

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

**Product characteristics:** 

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

Amounts used:

Not applicable.

Frequency and duration of use:

Continuous release.

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

Not applicable.

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

Technical conditions and measures to control dispersion

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

from source towards the worker: Organisational measures to prevent/limit releases, removal efficiency of (%): 90% 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%

### Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact) **Product characteristics:** 

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

Amounts used:

Not applicable.

Frequency and duration of use:

Continuous release.

Human factors not influenced by risk management:

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

Other given operational conditions affecting workers

Indoor. industrial setting

exposure:

Not applicable.

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

Technical conditions and measures to control dispersion

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

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. Wear appropriate respiratory protection, with a

minimum efficacy of 90%

## Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

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

**Product characteristics:** Amounts used:

Not applicable.

Frequency and duration of use:

Avoid carrying out operation for more than 1 hour.

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

exposure:

Indoor, industrial setting

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

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

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

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

Not applicable.

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%

Tetraethylenepentamine, TEPA

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

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

Substance supplied to that use in form of: As such Sector of end use: SU03

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

Section 2.2: Control of worker exposure

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

containers at dedicated facilities

**Product characteristics:** 

Amounts used:

Frequency and duration of use:

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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

Not applicable.

Do not carry out operation for more than 4 hours

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

Indoor, industrial setting

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls.

Section 2.2: Control of worker exposure

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

including weighing)

**Amounts used:** 

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

Not applicable. Continuous release.

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 as laboratory reagent

**Product characteristics:** 

Amounts used: Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

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

Not applicable.

Continuous release.

Default breathing volume Light work: 10 m<sup>3</sup>/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%

Tetraethylenepentamine, TEPA

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

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7	4.36x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

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

Release from point source

(local exposure estimation) kg/

	day		
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	<b>EUSES</b> calculation
Marine water mg/l	2.33x10-7	4.36x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification

Total release for regional

exposure estimation kg/day

Tetraethylenepentamine, TEPA

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

**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

Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

# Section 3:.1 Environment - Exposure estimation

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

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	<b>EUSES</b> calculation
Marine water mg/l	0	4.34x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	0	3.94x10-10	<b>EUSES</b> 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: Manufacture of coatings, adhesives and inks (and powder products)

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.269	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
air (direct + STP)	0	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.084	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	127	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	8.35x10-5	5.21x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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

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

Substance supplied to that use in form of: As such Sector of end use: SU03

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

Marine water mg/l	8.35x10-5	1.27x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.263	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.064	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.25x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.43x10-11	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.1x10-12	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	1.29x10-12	3.95x10-10	<b>EUSES</b> calculation
Annual deposition mg/m²/d	2.74x10-12	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Micro-organism mg/r	Not applicable.	Not applicable.	тчог аррпсавте.
Section 3:.2 Workers - Exposure of Contributing scenario controlling		closed process, no likelihood of	exposure
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.007	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.06	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.

Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic,	Not applicable	Not applicable.	Since the substance is not classified for

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

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

Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable 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. Short term exposure, Local, Not applicable. 0.12 The ECETOC TRA tool has been used to

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

Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Use in closed, continuous process with occasional controlled exposure Route of exposure **Contributing scenarios Dose/Concentration Justification** 

The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.14 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

Tetraethylenepentamine, TEPA 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

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Industrial

Long term exposure, Systemic, Not applicable. 0.548 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. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable Not applicable. Not applicable. Inhalable Not applicable. Short term exposure, Systemic, Not applicable Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, Not applicable. 0.55 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

Section 3:.2 Workers - Exposure estimation

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

**Dose/Concentration Route of exposure Contributing scenarios Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 0.30 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 Not applicable. Long term exposure, Local, Dermal Not applicable. Not applicable. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable.

Inhalable

Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined

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

Short term exposure, Local, Not applicable. 0.62 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

below this value

Section 3:.2 Workers - Exposure estimation

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

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

Long term exposure, Systemic, Not applicable.

**Dermal** 

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

Tetraethylenepentamine, TEPA

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

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,	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.62	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling we (multistage and/or significant contact Route of exposure	orker exposure for 4: Mixing	or blending in batch processes	for formulation of preparations* and articles  Justification
Long term exposure, Systemic, Dermal	Not applicable.	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	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,	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, Local, Inhalable	Not applicable.	0.60	has been derived.  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the
			highest exposure level is given since the exposure estimates for other PROC are below this value

Not applicable.

Not applicable.

 $Tetra ethylen epentamine,\ TEPA$ 

Short term exposure, Systemic,

Short term exposure, Local, Dermal 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% -

has been derived.

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

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

Sector of end use: SU03

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

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

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Systemic, Inhalable

Not applicable

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

has been derived.

has been derived.

PROC08a, PROC08b, PROC09, PROC15 Substance supplied to that use in form of: As such

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

Sector of end use: SU03

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

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 est	imation		
Contributing scenario controlling weighing)	orker exposure for 7: Transfe	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.	0.14	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.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.62	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est	imation		
Contributing scenario controlling we		laboratory reagent	
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.
Tetraethylenepentamine, TEPA		Identified use name:	Use of ethylenamines in closed system with little

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

Long term exposure, Local, Inhalable

Not applicable.

Not applicable.

Not applicable.

Short term exposure, Systemic, **Dermal** 

Not applicable.

Not applicable.

Not applicable.

Short term exposure, Systemic, Inhalable

Not applicable.

Not applicable.

Not applicable.

Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Combined

Short term exposure, Local, Dermal

Short term exposure, Local, 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

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.

Tetraethylenepentamine, TEPA

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

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

Substance supplied to that use in form of: As such Sector of end use: SU03

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



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

Industrial

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

Section 1:: Title

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

preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09

Substance supplied to that use in form of: As such

Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 18600 25% Fraction of Regional tonnage used locally: 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

Tetraethylenepentamine, TEPA

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

300

Indoor, industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

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%.

=>37.4

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater

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

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such

Sector of end use: SU03

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

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

7 36x10-4

Indoor, industrial setting

1.00x10-4

4.84x10-8

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%.

=>37.4

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

2000

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 9300 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 10300 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 225

Tetraethylenepentamine, TEPA

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

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of (%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

River flow rate: >= 2.0x10 6m3/d

Indoor. industrial setting

7 36x10-4

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 applicable as there is no release to wastewater.

Not available

### Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 21500 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day):

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

RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Not applicable.

Not available.

Not available.

Continuous release.

225

Indoor, industrial setting

7.36x10-4

5.00x10-5

Not available.

Not available

Not available. Not applicable.

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

Tetraethylenepentamine, TEPA

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

Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%.

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

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

Not available.

=>37 4

Conditions and measures related to municipal sewage treatment

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

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

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

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

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

Other given operational conditions affecting workers exposure:

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

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor. industrial setting

Local exhaust ventilation should be provided. with a minimum efficacy of 90%

Not applicable.

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 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: Continuous release. 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.

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

Indoor, industrial setting

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: Continuous release.

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:

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

Indoor. industrial setting

Not applicable.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

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

Personal protection:

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

### Section 2.2: Control of worker exposure

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

including weighing)

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Continuous release.

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

**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	Guotinoution
Waste water	<b>day</b> 7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7	4.36x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

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

## Section 3:.1 Environment - Exposure estimation

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

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7	4.36x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

## Section 3:.1 Environment - Exposure estimation

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

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	<b>day</b> 0	19.2	EUSES calculation
	· ·	4.8	
Surface water	Not evaluated.		EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	<b>EUSES</b> calculation
Marine water mg/l	0	4.34x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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

**Justification** 

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	0	3.94x10-10	<b>EUSES</b> 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: Manufacture of coatings, adhesives and inks (and powder products)

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.269	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.084	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	127	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	8.35x10-5	5.21x10-4	EUSES calculation
Marine water mg/l	8.35x10-5	1.27x10-4	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.	0.263	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.064	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.25x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.43x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.1x10-12	Not evaluated.	EUSES calculation
Annual average mg/m³	1.29x10-12	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	2.74x10-12	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 - E	xposure	estimation
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Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact	et)		
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 evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	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.	

Tetraethylenepentamine, TEPA

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

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

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

Long term exposure, Systemic,

Inhalable

Route of exposure **Contributing scenarios Dose/Concentration** Long term exposure, Systemic, Not applicable. 0.005

Not applicable.

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

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

The ECETOC TRA tool has been used to

**Justification** 

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

0.31

below this value

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

Long term exposure, Local, Dermal Not evaluated. 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

has been derived.

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

has been derived

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

Inhalable acute effects and therefore, no acute DNEL

has been derived.

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

has been derived.

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

acute effects and therefore, no acute DNEL

has been derived.

0.61 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 3:.2 Workers - Exposure estimation

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

containers at dedicated facilities

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

Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.005 Dermal

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

below this value

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

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

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

Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Not applicable. Not applicable. Long term exposure, Local, Dermal Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1.22 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the

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. 0.005 The ECETOC TRA tool has been used to **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

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. Not applicable.

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

Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable

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

Combined

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

Short term exposure, Local, Not applicable. 1.22 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

exposure estimates for other PROC are

below this value

below this value

below this value

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

Environment Not available.

Health Not available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

**Tetraethylenepentamine, TEPA**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** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

Section 1:: Title

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

preparations containing EA up to 0.5% - Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09

Substance supplied to that use in form of: As such

Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 18600 25% Fraction of Regional tonnage used locally: 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: >=2.0x10 6 m3/d

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Tetraethylenepentamine, TEPA

=>37.4

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

Not available

Indoor, industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

Not available.

Not available

Not available.

Not applicable.

Prevent discharge of undissolved substance to or recover from onsite

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

wastewater

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

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such

Sector of end use: SU03

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

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available 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: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Not available.

Continuous release

1000 River flow rate: >=2.0x10 6 m3/d

Indoor, industrial setting

7 36x10-4

1.00x10-4

4.84x10-8

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%.

=>37.4

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available 9300

Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 10300 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 225

Tetraethylenepentamine, TEPA

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

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

Environment factors not influenced by risk management:

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

only):

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of (%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1000 River flow rate: >=2.0x10 6 m<sup>3</sup>/d

1000

Indoor. industrial setting

7 36x10-4

Not available.

Not available.

Not available.

Not applicable.

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

No wastewater treatment required. Not applicable as there is no release to wastewater.

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

Not available

## Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 21500 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Frequency and duration of use:

Emission Days (days/year): 225

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 RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

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

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Not applicable.

Not available.

Continuous release.

Indoor, industrial setting

7.36x10-4

5.00x10-5

Not available.

Not available

Not available. Not applicable.

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

Tetraethylenepentamine, TEPA

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

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

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

Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%.

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site: Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

=>37 4

Conditions and measures related to municipal sewage treatment

plant:

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

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Continuous release.

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

Not applicable.

Indoor. industrial setting

(source) to prevent release:
Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: 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: Continuous release.

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:

adoor industrial eatting

Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

management supervision controls.

Section 2.2: Control of worker exposure

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

containers at dedicated facilities

**Product characteristics:** 

Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use:

Continuous release.

Human factors not influenced by risk management:

Default breathing vo

Other given operational conditions affecting workers exposure:

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

Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

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.

Tetraethylenepentamine, TEPA

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

Personal protection:

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

#### Section 2.2: Control of worker exposure

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

including weighing)

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

Amounts used:

Not applicable.
Continuous release.

Frequency and duration of use:

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:

Not applicable.

Technical conditions and measures to control dispersion

Not applicable.

from source towards the worker:

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

Not applicable.

Personal protection:

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

**Justification** 

management supervision controls.

Total release for regional

### **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	Gustinoution
Waste water	<b>day</b> 7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	<b>EUSES</b> calculation
Marine water mg/l	2.33x10-7	4.36x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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 relevant for that use: No

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

## Section 3:.1 Environment - Exposure estimation

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

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7	4.36x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	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	oustineation
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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

**Justification** 

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

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

PEC air (local+regional) **Justification Local concentration** During emission mg/m<sup>3</sup> Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d 0 Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Not applicable. 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: Manufacture of coatings, adhesives and inks (and powder products)

Total release for regional

**Justification** 

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.269	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.084	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	127	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	8.35x10-5	5.21x10-4	<b>EUSES</b> calculation
Marine water mg/l	8.35x10-5	1.27x10-4	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.263	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.064	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.25x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.43x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.1x10-12	Not evaluated.	EUSES calculation
Annual average mg/m³	1.29x10-12	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	2.74x10-12	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)

Doute of avecause	Contribution consular	Dana/Composituation	locatification
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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Industria

Process Category: PROC05, PROC08a, PROC08b, PROC09
Substance supplied to that use in form of: As such
Sector of end use: SU03

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

Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Not applicable. Short term exposure, Local, 1.52 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: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **Contributing scenarios** Route of exposure **Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.001 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 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 evaluated. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Since the substance is not classified for Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration** Justification The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.001 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.76 The ECETOC TRA tool has been used to Long term exposure, Systemic, 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.

Tetraethylenepentamine, TEPA

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

Industrial

Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: As such Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

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

Inhalable Short term exposure, Systemic, Not applicable

Combined

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

Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1 52 Inhalable

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

Not applicable.

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)

Inhalable

Inhalable

Route of exposure **Contributing scenarios Dose/Concentration** Justification The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.001 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

below this value Long term exposure, Systemic, 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

exposure estimates for other PROC are

below this value

Not applicable.

Not applicable.

Not applicable.

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. Not applicable. Inhalable

Short term exposure, Systemic,

**Dermal** Short term exposure, Systemic,

Not applicable. Not applicable.

Not applicable.

Not applicable.

Combined Short term exposure, Local, Dermal

Short term exposure, Local, Inhalable

Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

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

Tetraethylenepentamine, TEPA

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



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

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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

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

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 18600 25% Fraction of Regional tonnage used locally: 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: >=2.0x10 6m3/d

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

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

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

=>37.4

Not available

Indoor, industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

Not available.

Not available

Not available.

Not applicable.

Prevent discharge of undissolved substance to or recover from onsite

wastewater

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

Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

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

80/291

Tetraethylenepentamine, TEPA

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: >=2.0x10 6m3/d

Local marine water dilution factor: Not applicable as there is no release to wastewater.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Indoor, industrial setting

7 36x10-4

1.00x10-4

4.84x10-8

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%.

=>37.4

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

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:

Not available Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 9300 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 10300 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 225

Tetraethylenepentamine, TEPA

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

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1000 River flow rate: >=2.0x10 6m3/d

Indoor. industrial setting

7 36x10-4

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 applicable as there is no release to wastewater.

Not available

#### Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 21500 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available. Continuous release. Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: >=2.0x10 6m3/d

Local marine water dilution factor: 1000

Indoor, industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

7.36x10-4

5.00x10-5

Not available.

Not available Not available.

Not applicable.

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

Tetraethylenepentamine, TEPA

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

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

wastewater.

Not available.

=>37 4

Conditions and measures related to municipal sewage treatment

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

Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

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

Amounts used: Not applicable.

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

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

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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls.

#### Section 3:: Exposure estimation

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

	(local exposure estimation) kg/	exposure estimation kg/day	Justification
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
air (direct + STP)	0	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp)	2.35x10-4	EUSES calculation	

Concentration in sewage (PECstp) 2.35x10-4

ma/l

Concentration in sewage sludge

mg/kg dwt

0.355

**EUSES** calculation

**Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 2 33x10-7 4 37x10-4 **EUSES** calculation **EUSES** calculation 4.36x10-5 Marine water mg/l 2 33x10-7 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. 0.221 EUSES calculation Not evaluated 0.022 **FUSES** calculation Marine water sediment mg/kg dwt Local concentration PEC soil (local+regional) **Justification** 1.21x10-3

Agricultural soil averaged mg/kg

dwt

Grassland averaged mg/kg dwt

Groundwater mg/l

During emission mg/m<sup>3</sup>

2.39x10-3

Not evaluated **Local concentration** 5.86x10-15

0.077 0.077 7 69x10-4

Not evaluated.

PEC air (local+regional)

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

**Justification** 

**Justification EUSES** calculation

Tetraethylenepentamine, TEPA

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

Annual average mg/m³ 4.82x10-15 3.94x10-10 EUSES calculation

Annual deposition mg/m²/d 1.02x10-14 Not evaluated. EUSES calculation

Local concentration PEC aquatic (local+regional) Justification

Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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

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

Micro-organism mg/l	Local concentration Not applicable.	PEC aquatic (local+regional) Not applicable.	<b>Justification</b> Not applicable.
Annual deposition mg/m²/d	1.02x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
dwt Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Agricultural soil averaged mg/kg	1.21x10-3	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
-	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
Marine water mg/l	2.33x10-7	4.36x10-5	EUSES calculation
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	Release from point source (local exposure estimation) kg/ day 7.50x10-4	Total release for regional exposure estimation kg/day  19.2	Justification  EUSES calculation

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 concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
Marine water mg/l	0	4.34x10-5	EUSES calculation
Fresh water mg/l	0	4.37x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
Waste water	0	19.2	EUSES calculation
	day	exposure estimation kg/day	
	(local exposure estimation) kg/	exposure estimation kg/day	

Tetraethylenepentamine, TEPA

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

Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	0	3.94x10-10	<b>EUSES</b> 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.

Release from point source

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

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

Total release for regional

**Justification** 

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.269	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.084	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	127	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	8.35x10-5	5.21x10-4	EUSES calculation
Marine water mg/l	8.35x10-5	1.27x10-4	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.	0.263	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.064	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.25x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.43x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.1x10-12	Not evaluated.	EUSES calculation
Annual average mg/m³	1.29x10-12	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	2.74x10-12	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	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.	0.31	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 evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Professional Process Category: PROC08a

Substance supplied to that use in form of: As such Sector of end use: SU22

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

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

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

Environment Not available.

Health Not available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



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

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

Section 1:: Title

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

preparations containing EA up to 0.5% - Professional

Process Category: PROC08a

Substance supplied to that use in form of: As such Sector of end use: SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

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

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 18600 25% Fraction of Regional tonnage used locally: 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 River flow rate: >=2.0x10 6m3/d

Local marine water dilution factor: Not applicable.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

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

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

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

=>37.4

Not available

Indoor. industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

Not available.

Not available

Not available.

Not applicable.

Prevent discharge of undissolved substance to or recover from onsite

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

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

wastewater

Tetraethylenepentamine, TEPA

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

> Professional Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

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

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% 4650 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 15500 Maximum daily site tonnage (kg/day): Not available 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: Not applicable.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

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

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

If discharging to domestic sewage treatment plant, provide

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

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

Continuous release.

1000 River flow rate: >=2.0x10 6m3/d

Indoor, industrial setting

7 36x10-4

1.00x10-4

4.84x10-8

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%.

=>37.4

Not available

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

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

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 9300 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 10300 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release

Emission Days (days/year): 225

Tetraethylenepentamine, TEPA

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

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of (%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

1000 River flow rate: >=2.0x10 6m3/d

Indoor. industrial setting

7 36x10-4

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 applicable as there is no release to wastewater.

Not available

#### Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year):

Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year):

Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day):

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 RMM):

Release fraction to soil from process (initial release prior to

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

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

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

Release fraction to wastewater from wide dispersive use:

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

Technical conditions and measures at process level (source) to

Not applicable.

Not available. 4840

25% 1210

21500 Not available.

Continuous release.

1000 River flow rate: >=2.0x10 6m3/d 1000

Indoor, industrial setting

7.36x10-4

5.00x10-5

Not available.

Not available

Not available. Not applicable.

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

Tetraethylenepentamine, TEPA

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

Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%.

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site: Prevent discharge of undissolved substance to or recover from onsite

=>37.4

Not available.

wastewater.

Conditions and measures related to municipal sewage treatment

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

Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

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

Amounts used: Not applicable.

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

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

Not applicable.

Not applicable.

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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Release from point source Total release for regional **Justification** (local exposure estimation) kg/ exposure estimation kg/day day **Waste water** 7.50x10-4 19.2 **EUSES** calculation **Surface water** Not evaluated. 4.8 **EUSES** calculation **EUSES** calculation air (direct + STP) 30.3 Soil (direct releases only) Not evaluated. 0 **EUSES** calculation **Value** Justification

Concentration in sewage (PECstp) 2.35x10-4 **EUSES** calculation

ma/l

0.355 Concentration in sewage sludge

mg/kg dwt

**EUSES** calculation

**Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 2 33x10-7 4 37x10-4 **EUSES** calculation **EUSES** calculation 4.36x10-5 Marine water mg/l 2 33x10-7 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. 0.221 EUSES calculation Not evaluated 0.022 **FUSES** calculation Marine water sediment mg/kg dwt

Local concentration PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 1.21x10-3 0.077 **EUSES** calculation

dwt

Grassland averaged mg/kg dwt

Groundwater mg/l During emission mg/m<sup>3</sup> 2.39x10-3 Not evaluated Local concentration 5.86x10-15

0.077 7 69x10-4 PEC air (local+regional) Not evaluated.

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

**Justification EUSES** calculation

Tetraethylenepentamine, TEPA

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

Professional Process Category: PROC08a

Substance supplied to that use in form of: As such Sector of end use: SU22

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

Annual average mg/m³ 4.82x10-15 3.94x10-10 EUSES calculation

Annual deposition mg/m²/d 1.02x10-14 Not evaluated. EUSES calculation

Local concentration PEC aquatic (local+regional) Justification

Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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

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

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	7.50x10-4	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	2.35x10-4	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	0.355	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7	4.36x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.21x10-3	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.39x10-3	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.86x10-15	Not evaluated.	EUSES calculation
Annual average mg/m³	4.82x10-15	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.02x10-14	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

	day	exposure estimation kg/day	
Waste water	0	19.2	<b>EUSES</b> calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Totracthylapapantamina, TEDA Identified use name: Use of athylapaminas in all			

Tetraethylenepentamine, TEPA

**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

Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	0	3.94x10-10	<b>EUSES</b> 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: Manufacture of coatings, adhesives and inks (and powder products)

Release from point source Total release for regional

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.269	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	EUSES calculation
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.084	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	127	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	8.35x10-5	5.21x10-4	EUSES calculation
Marine water mg/l	8.35x10-5	1.27x10-4	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.	0.263	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.064	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.25x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.43x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	2.1x10-12	Not evaluated.	EUSES calculation
Annual average mg/m³	1.29x10-12	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	2.74x10-12	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

## Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	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 evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Not applicable Long term exposure, Local, Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



Industrial

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

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

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

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

Environment factors not influenced by risk management:

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

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

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

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

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

No wastewater treatment required.

Not available.

7 36x10-4

Not available.

Not available.

Not available.

Not applicable.

Organisational measures to prevent/limit release from site:

Tetraethylenepentamine, TEPA

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

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

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

preparations containing EA up to 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

If discharging to domestic sewage treatment plant, provide

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

Conditions and measures related to municipal sewage treatment

Not applicable.

Not available.

4650

Not available.

220

1000

None.

7.36x10-4

Not available

Not available.

Not available.

Not applicable.

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

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

No wastewater treatment required.

Not available

## Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

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

Emission Days (days/year): 220

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Environment factors not influenced by risk management:

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

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of (%):

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

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

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

Release fraction to soil from wide dispersive use (regional

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

prevent release:

Not applicable.

300

5.00x10-4

1 00x10-2

5.00x10-3

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

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

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

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

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

Release fraction to soil from process (initial release prior to

RMM):

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

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

Release fraction to soil from wide dispersive use (regional

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

4840

Not available

7.36x10-4

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

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

300 Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

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

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

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

930

Not available.

None

7.36x10-4

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%.

=>37 4

Not available

Continuous release.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

Emission Days (days/year): 220

Environment factors not influenced by risk management:

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

Tetraethylenepentamine, TEPA

Frequency and duration of use:

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

None. Other given operational conditions affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36x10-4 Release fraction to soil from process (initial release prior to 1.00x10-3 Release fraction to wastewater from process (initial release 1.00x10-3 prior to RMM): Not available. Release fraction to air from wide dispersive use (regional Not available. Release fraction to soil from wide dispersive use (regional only): Release fraction to wastewater from wide dispersive use: Not available Technical conditions and measures at process level (source) to Not applicable. 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%.

Not available.

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) =>37 4 to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

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

Conditions and measures related to municipal sewage treatment plant:

# Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

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

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

Release fraction to soil from wide dispersive use (regional

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

prevent release:

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

Not available.

7 36x10-4

Not available

Not available. Not applicable.

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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Treat air emission to provide a typical removal efficiency of

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

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

No wastewater treatment required.

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

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): 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: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

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

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

1000

7.36x10-04

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

Product characteristics:

Amounts used:

Frequency and duration of use:

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 25%.

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

containers at non-dedicated facilities

**Product characteristics:** 

Frequency and duration of use:

requestey 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 25%.

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

containers at dedicated facilities

**Product characteristics:** 

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

Amounts used:

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 25%.

Not applicable.

Do not use for more than 1 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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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:

Amounts used:

Frequency and duration of use:

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

ovnocuro.

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 25%.

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

raining. Wear chemical-resistant gloves (tested to EN3/4) 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	
Waste water	<b>day</b> 0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Section 3:.1	Environment - Ex	cposure estimation
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Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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

Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	0	4.34x10-5	EUSES calculation
Fresh water mg/l	0	4.37x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
air (direct + STP)	0	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	0	19.2	EUSES calculation
	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation PEC air (local+regional) **Local concentration Justification** During emission mg/m<sup>3</sup> 0 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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

Contributing scenario controlling environmental exposure for 3: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	EUSES calculation
Mioro organism ma//	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: Metal working fluids

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Fresh water sediment mg/kg dwt	Local concentration  Not evaluated.	PEC sediment (local+regional) 0.239	Justification EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10-6	6.52x10-6	EUSES calculation
Annual deposition mg/m²/d	1.38x10-5	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 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	

Tetraethylenepentamine, TEPA

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

rocess 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Concentration in sewage (PECstp) 1.23x10-3 **EUSES** calculation mg/l Concentration in sewage sludge 1 86 **EUSES** calculation mg/kg dwt **Local concentration** PEC aquatic (local+regional) **Justification** 1.22x10-6 EUSES calculation Fresh water mg/l 4.38x10-4 **EUSES** calculation Marine water mg/l 1.22x10-6 4.46x10-5 Intermittent release. mg/l Not applicable. Not applicable. Not applicable. Local concentration PEC sediment (local+regional) **Justification** EUSES calculation Not evaluated. Fresh water sediment mg/kg dwt 0.221 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated 0.023 **Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 1.22x10-5 0.077 **EUSES** calculation dwt Grassland averaged mg/kg dwt 2.42x10-5 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m<sup>3</sup> 8.06x10-7 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 4.86x10-7 4.86x10-7 **EUSES** calculation Annual deposition mg/m²/d 1.03x10-6 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration Justification** Not applicable. Micro-organism mg/l Not applicable. Not applicable.

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

Contributing scenario controlling environmental exposure for 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d	6.52x10-6	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 3:.1	<b>Environment -</b>	<b>Exposure</b>	estimation
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Contributing scenario controlling environmental exposure for 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3:.2 Workers - Exposure estimation

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0685714	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.3656	The ECETOC TRA tool has been used to estimate workplace 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 evaluated.	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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 0.73115 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.0685714 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. 0.365575 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not evaluated Not applicable. Not applicable. Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, Not applicable. 0.73115 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 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.034286 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Long term exposure, Systemic, Not applicable. 0.548325 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

Identified use name: Use of ethylenamines in open processes with high Tetraethylenepentamine, TEPA 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, nhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, 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, nhalable	Not applicable.	1.096725	The ECETOC TRA tool has been used to estimate workplace 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 3: Transfer of substance or preparation into small containers (dedicated filling line,

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0685714	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	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
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, nhalable	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, nhalable	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.	0.73115	The ECETOC TRA tool has been used to estimate workplace exposures unless

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

below this value

Sector of end use: SU03

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

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

Environment Not available.
Health Not available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



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

Industrial

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Section 2.1:	Control of	environmental	exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

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

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

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%):

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

If discharging to domestic sewage treatment plant, provide

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

4840

1000

7 36 10-4

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

> ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 111/291

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

plant:

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): 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: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

1000

7.36.10-4

Not available.

Not available

Not available.

Not applicable.

Not available.

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

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

No wastewater treatment required.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114 Maximum daily site tonnage (kg/day): Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Frequency and duration of use: Continuous release. 220

Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

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 3 (%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36.10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 155

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

Emission Days (days/year): 300

Environment factors not influenced by risk management:

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

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):

186

None

5.00.10-4

1.00.10-2

5.00.10-3

Not available.

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Release fraction to wastewater from wide dispersive use:

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Conditions and measures related to municipal sewage treatment plant:

Not available. Not applicable.

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

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

=>37.4

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environment factors not influenced by risk management:

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

exposure:

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

Release fraction to soil from process (initial release prior to

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

prior to RMM):

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

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

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Not available.

7.36.10-4

1.00.10-3

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

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

Emission Days (days/year): 300

Environment factors not influenced by risk management:

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 7.36.10-4 RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release 0.01 prior to RMM):

Release fraction to air from wide dispersive use (regional

1 00 10-3

Not available.

Not available.

=>37 4

Not available

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

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

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

If discharging to domestic sewage treatment plant, provide

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Tetraethylenepentamine, TEPA

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

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

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

preparations containing EA up to 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36.10-4

1.00.10-3

1 00 10-3

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%.

=>37 4

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 1400 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): 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 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

Not available.

5580

Not available.

Continuous release.

220

7.36.10-4

Not available.

Not available.

Not available.

Not applicable.

discharges, air emissions and releases to soil:

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 3 (%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No wastewater treatment required.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 2114 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

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

Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available

Not available.

1000

7.36E-04

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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:

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:

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

Not applicable.

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

Human factors not influenced by risk management: 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 2: Industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 15%

**Amounts used:** Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

minimum efficacy of 90%

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

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 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.

Liquid. Covers concentrations up to 15%

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

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

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

Not applicable.

containers at 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:

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

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

removal efficiency of (%): 90%

Indoor, industrial 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.

Liquid. Covers concentrations up to 15%

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,

Not applicable.

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:

Not applicable.

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

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

removal efficiency of (%): 90%

Indoor, industrial setting

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used:

Exposure duration per day: 1-4 hours

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.

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

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

Not applicable.

Not applicable.

Indoor, industrial 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.

Section 2.2: Control of worker exposure

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

pelletisation

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

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

Indoor, industrial setting 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

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 from source towards the worker: removal efficiency of (%): 90%

Not applicable.

Not applicable.

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

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

management supervision controls.

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Value

	(local exposure estimation) kg/	exposure estimation kg/day	
	day		
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]

Release from point source

Concentration in sewage (PECstp)

Concentration in sewage sludge

mg/kg dwt

Fresh water mg/l

Not applicable as there is no release to wastewater.

Not applicable as there is no release to wastewater.

**EUSES** calculation

Justification

Total release for regional

**EUSES** calculation

Local concentration PEC aquatic (local+regional) **Justification** n 4.37x10-4 **EUSES** calculation

0 4.34x10-5 Marine water mg/l **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. Local concentration **Justification** PEC sediment (local+regional)

Not evaluated. 0.221 **EUSES** calculation Fresh water sediment mg/kg dwt

Tetraethylenepentamine, TEPA

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

Justification

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

Substance supplied to that use in form of: In a mixture Sector of end use: SU03

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

ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 0 4.37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation PEC soil (local+regional) **Local concentration** Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation 0.077 EUSES calculation Grassland averaged mg/kg dwt Not evaluated. Groundwater mg/l 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) Justification During emission mg/m<sup>3</sup> Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. 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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

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

Contributing scenario controlling environmental exposure for 4: Metal working fluids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

3.24x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l Not evaluated. **EUSES** calculation 7.70x10-4 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 7.93x10-6 Not evaluated. **EUSES** calculation Annual average mg/m³ 6.52x10-6 **EUSES** calculation 6.52x10-6 Annual deposition mg/m²/d 1.38x10-5 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) Local concentration Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

(multistage and/or significant conta 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, nhalable	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 evaluated.	Not applicable.	Not applicable.
ong term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, nhalable	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.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling w		oring operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, nhalable	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 evaluated.	Not applicable.	Not applicable.
ong term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, nhalable	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, nhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, 0.914 The ECETOC TRA tool has been used to Not applicable. 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 2: Industrial spraying Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.1286 estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.457 The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not evaluated. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to 0.914 Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration** Justification The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.0411 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.548 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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Systemic, Combined	Not evaluated.	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.	1.097	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est	imation		
•		er of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long form exposure Local	Not applicable	Not applicable	Since the substance is not classified for

Route of exposure	Contributing Scenarios	Dose/Concentration	Justinication
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Ocettes of Owest			
Section 3:.2 Workers - Exposure est Contributing scenario controlling wa including weighing)		er of substance or preparation in	nto small containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	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.	0.914	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ent of articles by dipping and po	puring
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0411	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the 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

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	The ECETOC TRA tool has been used to estimate workplace 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 evaluated.	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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

has been derived.

Not applicable.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

1.097

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

below this value

Section 3:.2 Workers - Exposure estimation

Short term exposure, Local, Dermal Not applicable

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

pelletisation

Route of exposure Long term exposure, Systemic, Dermal

**Contributing scenarios** Not applicable. 0.0822

**Dose/Concentration Justification** 

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

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.457

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

exposure estimates for other PROC are below this value

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal

Long term exposure, Local,

Inhalable

Not evaluated

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,

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. 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

Short term exposure, Local,

Inhalable

Not applicable.

0.914

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

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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



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

Industrial

# Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13,

PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4840 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

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

Emission Days (days/year): 300

Environment factors not influenced by risk management:

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 7.36.10-4

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Not available

Release fraction to soil from wide dispersive use (regional

only):

Not available.

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

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

# Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): 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 None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Not available

220

7 36 10-4

Not available.

Not available

Not available.

Not applicable.

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

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

No wastewater treatment required.

Not available.

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

> 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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Emission Days (days/year): 220

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7 36 10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region:

186 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

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

300 Emission Days (days/year):

Environment factors not influenced by risk management:

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

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

prior to RMM):

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

5.00.10-3

5.00.10-4

1.00.10-2

Not available.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Release fraction to wastewater from wide dispersive use:

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available

Not available.

Not applicable.

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

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

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 5500 Average Local Daily Tonnage (kg/day):

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

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

4840

Not available

220

1000

None.

7.36.10-4

1.00.10-3

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

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

None.

0.01

Not available.

=>37 4

Not available

Continuous release.

Emission Days (days/year): 300

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 7.36.10-4

RMM):

Release fraction to soil from process (initial release prior to 1 00 10-3 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

only):

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

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

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: 220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

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

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

only):

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

prevent release:

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36.10-4

1.00.10-3

1 00 10-3

Not available.

Not available.

Not available.

Not applicable.

Not available.

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

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

=>37 4

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 1400 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 6364

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

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:

Not available.

5580

220

7.36.10-4

Not available

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 3 (%):

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

Not available

No wastewater treatment required.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114 Maximum daily site tonnage (kg/day):

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 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

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

220

7.36E-04

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.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Not applicable.

Not applicable.

Not applicable.

Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Industrial spraying

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

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

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 2%

Amounts used: Not applicable.

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

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

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

Technical conditions and measures at process level 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:** 

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.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09,

PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities

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

Amounts used: Not applicable.

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

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

Not applicable.

Indoor, industrial setting

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable. Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

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

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Not applicable.

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

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Contributing scenario controlling worker exposure for 6: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Do not use 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

Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Not applicable.

Local exhaust ventilation should be provided. with a minimum efficacy 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

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting Indoor, professional setting exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

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 8: Production of preparations\* or articles by tabletting, compression, extrusion,

pelletisation

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Other given operational conditions affecting workers

exposure:

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity Personal protection:

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used:

Not applicable.

Frequency and duration of use:

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Indoor. industrial setting Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Use the following local exhaust ventilation types: Treat air emission to provide a typical removal efficiency of (%): 90%

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

**Section 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 3:.1	Environment - Ex	posure estimation
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Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19 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: SU03, SU22
Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l Not evaluated. **EUSES** calculation 7.69x10-4 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m<sup>3</sup> 0 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration** Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 3: Electroplating.

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [REACH]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	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: Metal working fluids

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [REACH]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3 59x10-5	4 73x10-4	FUSES calculation

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 143/291

Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.15x10-12	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [REACH]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10-6	6.52x10-6	EUSES calculation
Annual deposition mg/m²/d	1.38x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

PROC10, PROC11, PROC13, PROC14, PROC19
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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 144/291

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [REACH]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.2 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	<b>Dose/Concentration</b>	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 evaluated.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19 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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est		ial annovina	
Contributing scenario controlling we			lugatification
Route of exposure Long term exposure, Systemic,	Contributing scenarios	Dose/Concentration	Justification The ECETOC TRA tool has been used to
Dermal	Not applicable.	0.09	estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Identified use name: Use of ethylenamines in 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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

exposure estimates for other PROC are

below this value

Contributing scenario controlling we containers at non-dedicated facilities	orker exposure for 2: Transfe	er of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.09	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 evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling we containers at dedicated facilities		er of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.05	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 evaluated.	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.
Tetraethylenepentamine, TEPA		Identified use name: U	Ise of ethylenamines in open processes with high

Section 3:.2 Workers - Exposure estimation

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived 1.22 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.05 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. 0.61 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not evaluated. 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 acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.22 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 5: Roller application or brushing Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.09 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.61 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

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19 Substance supplied to that use in form of: In a mixture

below this value

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, ERC07, ERC08a, ERC08b, ERC08c.

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	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
Short term exposure, Local, Inhalable	Not applicable.	1.22	has been derived.  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est Contributing scenario controlling w		rial spraying	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal		Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling w		of articles by dipping and pouring	
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.	Not applicable.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Short term exposure, Local, Dermal Not applicable. Not applicable. Short term exposure, Local, Not applicable. The ECETOC TRA tool has been used to 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 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 0.05 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 0.61 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 Long term exposure, Systemic, Not applicable.

Long term exposure, Local, Dermal Long term exposure, Local,

Inhalable Short term exposure, Systemic,

**Dermal** Short term exposure, Systemic,

Inhalable Short term exposure, Systemic,

Combined Short term exposure, Local, Dermal Short term exposure, Local,

Inhalable

Route of exposure

Combined

Not applicable.

Not applicable. Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable. Not applicable. Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable. 1.22

**Dose/Concentration** 

Not applicable.

Not applicable.

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

**Justification** 

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available

**Contributing scenarios** 

Not applicable.

Not applicable.

Not applicable.

The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.09 Not applicable **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.61 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.

Not applicable.

Not applicable.

Long term exposure, Local,

Long term exposure, Systemic,

Long term exposure, Local, Dermal

Combined

Inhalable

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09,

Not applicable.

Not applicable.

Not applicable.

PROC10, PROC11, PROC13, PROC14, PROC19 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

**Dermal** 

Short term exposure, Systemic,

Inhalable

Short term exposure, Systemic,

Combined

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable.

Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

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

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.

Tetraethylenepentamine, TEPA

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, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



Industrial

#### Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, PROC11, PROC13,

PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

#### Section 2:: Operational conditions and risk management measures

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4840 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

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 7.36.10-4

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

only):

Release fraction to air from wide dispersive use (regional Not available

Release fraction to soil from wide dispersive use (regional

only):

Not available.

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not available.

Technical on-site conditions and measures to reduce or limit

Not applicable.

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only): Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

Not applicable.

4650

Not available

1000

7 36 10-4

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.

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

> ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 154/291

Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant:

220

7 36 10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Not available Fraction of EU tonnage used in region:

186 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

1.00.10-2

5.00.10-4

5.00.10-3

Release fraction to air from wide dispersive use (regional

only):

Not available.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

> 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Release fraction to soil from wide dispersive use (regional only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 5500 Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

4840

Not available

220

1000

7.36.10-4

1.00.10-3

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

> 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to 7.36.10-4

RMM):

Release fraction to soil from process (initial release prior to 1 00 10-3

RMM):

Release fraction to wastewater from process (initial release 0.01

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 applicable.

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil.

=>37 4

Continuous release.

Not available.

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000

Tetraethylenepentamine, TEPA

Frequency and duration of use:

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

No air emission controls required; required removal efficiency is 0%.

Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36.10-4

1.00.10-3

1 00 10-3

Not available.

Not available.

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>37 4

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

5580 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 1400 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

Not available.

Not available.

220

1000

7.36.10-4

Not available

Not available.

Not available.

Not applicable.

discharges, air emissions and releases to soil:

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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%.

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No wastewater treatment required.

Not available

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

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

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

None.

7.36E-04

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.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

> 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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 159/291

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Indoor. industrial setting Other given operational conditions affecting workers

Indoor, industrial setting and professional setting exposure: Indoor. professional setting

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

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: Industrial spraying

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

Indoor. professional setting exposure: Not applicable.

Technical conditions and measures at process level (source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

Not applicable.

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 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).

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: Indoor, industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

**Personal protection:** 

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Not applicable.

Not applicable.

Indoor. industrial setting Other given operational conditions affecting workers

exposure: Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(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.

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,

Not applicable.

Not applicable.

Not applicable.

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

Indoor, industrial setting and professional setting exposure:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

management supervision controls.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting Indoor, industrial setting and professional setting

exposure:

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

Indoor. professional setting

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Contributing scenario controlling worker exposure for 6: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use:

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

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:

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 0.5% 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

exposure:

Amounts used:

Indoor, industrial setting

Indoor, industrial setting and professional setting Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 8: Production of preparations\* or articles by tabletting, compression, extrusion,

pelletisation

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting Indoor, industrial setting and professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor, professional setting

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. industrial setting

exposure:

Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

#### **Section 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 3:.1	Environment -	Exposure es	timation
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Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg	0	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19 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, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l Not evaluated. **EUSES** calculation 7.69x10-4 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m<sup>3</sup> 0 **EUSES** calculation Not evaluated. Annual average mg/m<sup>3</sup> 0 **EUSES** calculation 3.94x10-10 Annual deposition mg/m²/d Not evaluated. 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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10 <sup>-4</sup>	5.58x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	1.92x10 <sup>-4</sup>	2.36x10 <sup>-4</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10 <sup>-11</sup>	0.077	EUSES calculation
Annual average mg/m³	1.24x10 <sup>-10</sup>	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10 <sup>-4</sup>	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: Metal working fluids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10 <sup>-5</sup>	4.73x10 <sup>-4</sup>	EUSES calculation

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC01a, ERC12a, ERC12b

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Marine water mg/l	5.73x10⁻⁵	1.01x10 <sup>-4</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.239	<b>EUSES</b> calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	<b>EUSES</b> calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10 <sup>-11</sup>	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10 <sup>-11</sup>	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10 <sup>-13</sup>	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	5.43x10 <sup>-13</sup>	3.95x10 <sup>-10</sup>	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.15x10 <sup>-12</sup>	Not evaluated.	<b>EUSES</b> 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: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10 <sup>-4</sup>	5.58x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	1.92x10 <sup>-4</sup>	2.36x10 <sup>-4</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10 <sup>-4</sup>	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10 <sup>-4</sup>	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10 <sup>-4</sup>	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10 <sup>-6</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10 <sup>-6</sup>	6.52x10 <sup>-6</sup>	EUSES calculation
Annual deposition mg/m²/d	1.38x10⁻⁵	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

PROC10, PROC11, PROC13, PROC14, PROC19
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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 166/291

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10 <sup>-3</sup>	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10 <sup>-3</sup>	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10 <sup>-3</sup>	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10 <sup>-6</sup>	4.38x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	1.22x10 <sup>-6</sup>	4.46x10 <sup>-5</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10⁻⁵	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10 <sup>-5</sup>	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10 <sup>-7</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10 <sup>-7</sup>	4.86x10 <sup>-7</sup>	EUSES calculation
Annual deposition mg/m²/d	1.03x10 <sup>-6</sup>	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 7: Processing aid

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10 <sup>-5</sup>	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19 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,

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Grassland averaged mg/kg dwt	1.53x10 <sup>-4</sup>	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10 <sup>-4</sup>	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10 <sup>-6</sup>	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	3.08x10 <sup>-6</sup>	3.08x10 <sup>-6</sup>	<b>EUSES</b> calculation
Annual deposition mg/m²/d	6.52x10 <sup>-6</sup>	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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	0	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

#### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles (multistage and/or significant contact)

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.14	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.	0.76	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.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19
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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. 1.52	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 est		ial anguing	
Contributing scenario controlling w			
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.11	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable.  Not applicable.	Not applicable. 1.22	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 est Contributing scenario controlling w containers at non-dedicated facilitie	orker exposure for 2: 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.	0.14	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.

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

Long term exposure, Local, Dermal Not applicable.

Not applicable. Not applicable. Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. 1.52	Not applicable. The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure esti Contributing scenario controlling we containers at dedicated facilities Route of exposure		r of substance or preparation (c  Dose/Concentration	harging/discharging) from/to vessels/large
Long term exposure, Systemic,	Niet en die elek		oud.iiioutioii
Dermai	Not applicable.	0.14	
Dermal  Long term exposure, Systemic, Inhalable	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,	·		The ECETOC TRA tool has been used to estimate workplace 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
Long term exposure, Systemic, Inhalable  Long term exposure, Systemic,	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  The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

			exposure estimates for oth 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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool h

has been used to stimate workplace 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.	0.14	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.	0.76	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.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. 1.52	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 est			
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.	0.76	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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. 1.52	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 est		dustrial enraving	
Contributing scenario controlling we	•		luctification
Route of exposure  Long term exposure, Systemic,	Contributing scenarios  Not applicable.	Dose/Concentration  Not applicable.	Justification  Not applicable.
Dermal Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Inhalable			
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
]	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

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 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 7: Treatment of articles by dipping and pouring Route of exposure **Dose/Concentration Contributing scenarios Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0 14 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.76 The ECETOC TRA tool has been used to Not applicable. Long term exposure, Systemic, Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Not applicable. Long term exposure, Local, Dermal Not applicable. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, Not applicable. 1.52 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 8: Production of preparations\* or articles by tabletting, compression, extrusion, pelletisation

Route of exposure **Contributing scenarios** Dose/Concentration **Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.14 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Not applicable. Long term exposure, Systemic, Combined Not applicable. Not applicable. Long term exposure, Local, Dermal Not applicable. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 172/291 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 9: Hand-mixing with intimate contact and only PPE available

**Contributing scenarios Dose/Concentration** Route of exposure

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

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

Long term exposure, Systemic,

Combined

Not applicable.

Not applicable.

Not applicable.

Long term exposure, Local, Dermal Not evaluated. 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

has been derived

Short term exposure, Systemic, **Dermal** 

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. 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.

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.

Tetraethylenepentamine, TEPA

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, PROC11, PROC13, PROC14, PROC19

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



**Professional** 

#### Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# Section 2:: Operational conditions and risk management measures

Section 2.1:	Control of	f environmental	exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 300

Environment factors not influenced by risk management:

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

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Not available.

No wastewater treatment required.

7 36x10-4

Not available.

Not available.

Not available.

Not applicable.

Organisational measures to prevent/limit release from site:

Tetraethylenepentamine, TEPA

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

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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.

4650 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available.

220

None.

7.36x10-4

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

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

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

Not available.

5.00x10-4

1 00x10-2

5.00x10-3

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Soil emission controls are not applicable as there is no direct release to soil. No air emission controls required; required removal efficiency is 0%.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840

Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to

RMM): Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available

None.

7.36x10-4

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

None

=>37 4

Not available

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to 1.00x10-3 RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Not available. Release fraction to air from wide dispersive use (regional

Not available. Release fraction to soil from wide dispersive use (regional

only):

Not available Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

Technical on-site conditions and measures to reduce or limit

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 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): 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: 1000 Local marine water dilution factor: 1000

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

Soil emission controls are not applicable as there is no direct release to soil.

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, ERC07, ERC08a, ERC08b, ERC08c,

> ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 178/291

None. Other given operational conditions affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36x10-4 Release fraction to soil from process (initial release prior to 1.00x10-3 Release fraction to wastewater from process (initial release 1.00x10-3 prior to RMM): Not available. Release fraction to air from wide dispersive use (regional Not available. Release fraction to soil from wide dispersive use (regional only): Release fraction to wastewater from wide dispersive use: Not available Technical conditions and measures at process level (source) to Not applicable. 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) =>37 4

Not available.

Organisational measures to prevent/limit release from site:

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

Conditions and measures related to municipal sewage treatment plant:

the required onsite wastewater removal efficiency of 3 (%):

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

7 36x10-4

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

No wastewater treatment required.

If discharging to domestic sewage treatment plant, provide

Not available.

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

## Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

1860

Continuous release.

1000

None

5.00x10-3

0.01

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>37.4

Not available

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Not applicable.

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable. Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Indoor, professional setting

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 25%

Amounts used: Not applicable.

Frequency and duration of use: Do not use for more than 0.25 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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

### Section 3:: Exposure estimation

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Value

	day	exposure estimation kyrday	
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
air (direct + STP)	0	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]

Concentration in sewage (PECstp)

ma/l Concentration in sewage sludge Not applicable as there is no

Release from point source

release to wastewater.

Not applicable as there is no release to wastewater.

**Local concentration** 

**Justification EUSES** calculation

**EUSES** calculation

mg/kg dwt Local concentration

Fresh water mg/l 0 Marine water mg/l Intermittent release, mg/l Not applicable. PEC aquatic (local+regional)

Total release for regional

**Justification** 4.37x10-4 **EUSES** calculation EUSES calculation 4.34x10-5 Not applicable. Not applicable. **Justification** PEC sediment (local+regional)

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

**Justification** 

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Fresh water sediment mg/kg dwt 0.221 Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg **EUSES** calculation 0.077 Grassland averaged mg/kg dwt 0 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) Justification During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m <sup>3</sup>	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 to wastewater.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstn)	Not applicable as there is no	FUSES calculation	

Tetraethylenepentamine, TEPA

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

luctification

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 4.37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation Not applicable. Intermittent release. mg/l Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation PEC soil (local+regional) **Local concentration Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation 0.077 EUSES calculation Grassland averaged mg/kg dwt Not evaluated. EUSES calculation Groundwater mg/l 7.69x10-4 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. 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: Electroplating.

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

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,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Metal working fluids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

**Identified use name:** Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

**Justification** 

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation Local concentration PEC air (local+regional) Justification Not evaluated. **EUSES** calculation During emission mg/m<sup>3</sup> 7.93x10-6 7.93x10-6 6 52x10-6 EUSES calculation Annual average mg/m<sup>3</sup> Annual deposition mg/m²/d 1.38x10-5 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 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
air (direct + STP)	0.018	30.3	<b>EUSES</b> calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

PEC sediment (local+regional) **Justification Local concentration** Fresh water sediment mg/kg dwt 0.221 Not evaluated **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 7.73x10-5 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 1.53x10-4 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 5 11x10-6 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 3 08x10-6 3.08x10-6 **EUSES** calculation Not evaluated. **EUSES** calculation Annual deposition mg/m²/d 6.52x10-6 **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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
Marine water mg/l	3.17x10-6	4.66x10-5	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.	0.222	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	2.00x10-12	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10-12	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.96x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	7.96x10-14	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.69x10-13	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

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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 186/291

Long term exposure, Systemic, Inhalable	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
Long term exposure, Systemic, Combined	Not evaluated.	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.	0.73115	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

containers at non-dedicated facility	ties		
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0685714	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.45697	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic,	Not evaluated.	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			

Since the substance is not classified for acute effects and therefore, no acute DNEL Not applicable. Inhalable

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL

has been derived.

Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, Combined acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 0.91393 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

Tetraethylenepentamine, TEPA 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

### Section 4:: Guidance to check compliance with the exposure scenario

**Environment** Not available. **Health** Not available.

# Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# Section 2:: Operational conditions and risk management measures

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 300

Environment factors not influenced by risk management:

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

RMM):

Release fraction to wastewater from process (initial release

Release fraction to air from wide dispersive use (regional

prior to RMM):

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

7 36x10-4

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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.

4650 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available.

220

1000

7.36x10-4

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860

Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

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:

Not applicable.

300

None

5.00x10-4

1 00x10-2

5.00x10-3

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840

Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 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

only): Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not applicable.

25%

Not available

1000

None.

7.36x10-4

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%.

Not available.

=>37.4

plant:

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to 1.00x10-3 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

only):

Not available Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

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:

=>37 4

Not available

Continuous release.

Not available.

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

Emission Days (days/year): 220

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Tetraethylenepentamine, TEPA

Frequency and duration of use:

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

No air emission controls required; required removal efficiency is 0%.

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

None. Other given operational conditions affecting environmental Release fraction to air from process (initial release prior to 7.36x10-4 Release fraction to soil from process (initial release prior to 1.00x10-3 Release fraction to wastewater from process (initial release 1.00x10-3 prior to RMM): Not available. Release fraction to air from wide dispersive use (regional Not available. Release fraction to soil from wide dispersive use (regional only): Release fraction to wastewater from wide dispersive use: Not available Technical conditions and measures at process level (source) to Not applicable. 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) =>37 4 to provide the required removal efficiency of 3 (%):

Not available.

Conditions and measures related to municipal sewage treatment plant:

Organisational measures to prevent/limit release from site:

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

7 36x10-4

Not available.

Not available

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

to provide the required removal efficiency of 3 (%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM): Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1860

Not available

1000

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%.

=>37.4

Not available

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** 

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.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work 10 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor, professional setting

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 10%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

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%

Indoor, professional setting

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.

Tetraethylenepentamine, TEPA

**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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

### 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ **EUSES** calculation 0 3.94x10-10 Annual average mg/m³ 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Fresh water mg/l Marine water mg/l Intermittent release. mg/l	Local concentration 1.20x10-4 1.92x10-4 Not applicable.	PEC aquatic (local+regional) 5.58x10-4 2.36x10-4 Not applicable.	Justification EUSES calculation EUSES calculation Not applicable.
Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 0.282 0.119	Justification EUSES calculation EUSES calculation
Agricultural soil averaged mg/kg dwt	Local concentration 0	PEC soil (local+regional) 0.077	Justification EUSES calculation
Grassland averaged mg/kg dwt Groundwater mg/l	Not evaluated.  Local concentration	0.077 7.69x10-4 PEC air (local+regional)	EUSES calculation EUSES calculation  Justification
During emission mg/m³ Annual average mg/m³ Annual deposition mg/m²/d Micro-organism mg/l	6.24x10-11 1.24x10-10 Not evaluated. Local concentration Not applicable.	0.077 0.077 7.69x10-4 PEC aquatic (local+regional) Not applicable.	EUSES calculation EUSES calculation EUSES calculation Justification Not applicable.

Total release for regional

**Justification** 

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	Justinication
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10 <sup>-6</sup>	6.52x10-6	EUSES calculation
Annual deposition mg/m²/d	1.38x10-5	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

exposure estimation kg/day

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

Release from point source

(local exposure estimation) kg/

<b>"</b>			
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	1.22x10-6	4.46x10-5	EUSES calculation
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
mg/kg dwt	1.00	EGGEG GAIGHIANN	
Concentration in sewage sludge	1.86	EUSES calculation	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	3.94x10-3	19.2	EUSES calculation
	day		

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional

**Justification** 

Process Category: PROC08a, PROC10, PROC11 Substance supplied to that use in form of: In a mixture

Sector of end use: SU22

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Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation PEC air (local+regional) Justification **Local concentration** Not evaluated. EUSES calculation During emission mg/m<sup>3</sup> 8.06x10-7 4 86x10-7 EUSES calculation Annual average mg/m³ 4.86x10-7 Annual deposition mg/m²/d 1.03x10-6 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 7: Processing aid

day			
Waste water 0		19.2	EUSES calculation
Surface water Not	evaluated.	4.8	EUSES calculation
air (direct + STP) 0.01	8	30.3	EUSES calculation
Soil (direct releases only) Not	evaluated.	0	Table R16.23 [ REACH ]
Valu	ıe	Justification	
	applicable as there is no ase to wastewater.	EUSES calculation	
	applicable as there is no ase to wastewater.	EUSES calculation	
Loca	al concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l 0		4.37x10-4	EUSES calculation
Marine water mg/l 0		4.34x10-5	EUSES calculation
Intermittent release. mg/l Not a	applicable.	Not applicable.	Not applicable.
Loca	al concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt Not	evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt Not	evaluated.	0.022	EUSES calculation
Loca	al concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg 7.73 dwt	3x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt 1.53	3x10-4	0.077	EUSES calculation
Groundwater mg/I Not of	evaluated.	7.70x10-4	EUSES calculation
Loca	al concentration	PEC air (local+regional)	Justification
During emission mg/m³ 5.11	x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³ 3.08	8x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d 6.52	2x10-6	Not evaluated.	EUSES calculation
Loca	al concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l Not a	applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
Marine water mg/l	3.17x10-6	4.66x10-5	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

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, ERC12a, ERC12b

Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration  Not evaluated.  Not evaluated.	PEC sediment (local+regional) 0.222 0.024	Justification EUSES calculation EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	2.00x10-12	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10 <sup>-12</sup>	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.96x10-14	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	7.96x10-14	3.94x10-10	<b>EUSES</b> calculation
Annual deposition mg/m²/d	1.69x10-13	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

	_		_	
Section	72 - 72	/ Workers -	-vnocuro	actimation

Section 3:.2 Workers - Exposure est			
Contributing scenario controlling was containers at non-dedicated facilitie		r of substance or preparation (c	charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0411	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	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 evaluated.	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.

The ECETOC TRA tool has been used to estimate workplace 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

Not applicable.

**Route of exposure** Long term exposure, Systemic,

Short term exposure, Local,

**Dermal** 

Inhalable

**Contributing scenarios** 

Not applicable.

**Dose/Concentration** 

0.0822

0.914

**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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 evaluated. Not applicable. 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 Long term exposure, Local, acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived Since the substance is not classified for Not applicable. 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, 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 2: Non industrial spraying Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.214 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 0.121 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 Long term exposure, Systemic, Not evaluated. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 0.243 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

Tetraethylenepentamine, TEPA

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

below this value

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

### Section 4:: Guidance to check compliance with the exposure scenario

Environment Not available.
Health Not available.

# Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

### Section 2:: Operational conditions and risk management measures

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 300

Environment factors not influenced by risk management:

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

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):

Not available. Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not available.

No wastewater treatment required.

7 36x10-4

Not available.

Not available.

Organisational measures to prevent/limit release from site:

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

preparations containing EA up to 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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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.

4650 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

Not available.

1000

7.36x10-4

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

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

7.36x10-4

Not available.

Not available

Not available.

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

5.00x10-4

1 00x10-2

5.00x10-3

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Soil emission controls are not applicable as there is no direct release to soil. No air emission controls required; required removal efficiency is 0%.

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Frequency and duration of use:

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25%

Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day):

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only): Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

Not available

Continuous release

None.

7.36x10-4

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

> ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 208/291

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to 1.00x10-3 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

only):

Not available Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to Not applicable.

Not available.

=>37 4

Not available

Continuous release.

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): Not available

Emission Days (days/year): 220

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000

Tetraethylenepentamine, TEPA

Frequency and duration of use:

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

preparations containing EA up to 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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

None. Other given operational conditions affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36x10-4 Release fraction to soil from process (initial release prior to 1.00x10-3 Release fraction to wastewater from process (initial release 1.00x10-3 prior to RMM): Not available. Release fraction to air from wide dispersive use (regional Not available. Release fraction to soil from wide dispersive use (regional only): Release fraction to wastewater from wide dispersive use: Not available

Technical conditions and measures at process level (source) to Not applicable.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

7 36x10-4

Not available.

Not available

=>37 4

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 None Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: 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:

Soil emission controls are not applicable as there is no direct release to soil.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

No wastewater treatment required.

If discharging to domestic sewage treatment plant, provide

Not available.

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

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

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available

None

5.00x10-3

0.01

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>37.4

Not available

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 211/291 Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** 

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.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

removal efficiency of (%): 90%

Indoor, professional setting

Liquid. Covers concentrations up to 2%

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

Covers daily exposures up to 8 hours (unless stated differently).

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**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%

Avoid carrying out operation for more than 4 hours.

Total release for regional

**EUSES** calculation

PEC aquatic (local+regional)

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. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

# Section 3:: Exposure estimation

#### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Release from point source

	(local exposure estimation) kg/ day	exposure estimation kg/day	
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]

**Justification** Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation

release to wastewater.

Not applicable as there is no Concentration in sewage sludge

mg/kg dwt release to wastewater.

Local concentration

0 EUSES calculation Fresh water mg/l 4 37x10-4 Marine water mg/l 0 4.34x10-5 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Justification** Local concentration PEC sediment (local+regional)

Not evaluated. EUSES calculation Fresh water sediment mg/kg dwt 0.221

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of

Justification

**Justification** 

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 4.37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation 0.077 EUSES calculation Grassland averaged mg/kg dwt Not evaluated. EUSES calculation Groundwater mg/l 7.69x10-4 **Local concentration** PEC air (local+regional) Justification During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. 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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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. elease Category: ERC01, ERC02, ERC04, ERC05.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Metal working fluids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) Justification Not evaluated. EUSES calculation During emission mg/m³ 7.93x10-6 6.52x10<sup>-6</sup> 6 52x10-6 EUSES calculation Annual average mg/m<sup>3</sup> Annual deposition mg/m²/d 1.38x10-5 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) Justification **Local concentration** Not applicable. Not applicable. Micro-organism mg/l Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	EUSES calculation

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

Intermittent release. mg/l	Not applicable.	Not applicable.  PEC sediment (local+regional)	Not applicable.
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	<b>EUSES</b> calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	<b>EUSES</b> calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	<b>EUSES</b> calculation
Annual deposition mg/m²/d	6.52x10-6	Not evaluated.	<b>EUSES</b> calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10-6	4.40x10-4	EUSES calculation
Marine water mg/l	3.17x10-6	4.66x10-5	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.	0.222	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	2.00x10-12	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10-12	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.96x10-14	Not evaluated.	EUSES calculation
Annual average mg/m³	7.96x10-14	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	1.69x10-13	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Route of exposure Contributing scenarios Dose/Concentration

Long term exposure, Systemic,

Dermal

Not applicable.

0.09

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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 Long term exposure, Local, Inhalable	Not evaluated. Not applicable	Not applicable.  Not applicable.	Not applicable.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est		atal assessins	
Contributing scenario controlling we Route of exposure	•	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Contributing scenarios  Not applicable.	0.21	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
			below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.15	The ECETOC TRA tool has been used to estimate workplace 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.	0.15  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
Inhalable  Long term exposure, Systemic,			The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Inhalable  Long term exposure, Systemic, Combined	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.
Inhalable  Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local,	Not applicable.  Not evaluated.	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.  Since the substance is not classified for acute effects and therefore, no acute DNEL
Inhalable  Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable  Short term exposure, Systemic,	Not applicable.  Not evaluated.  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.  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
Inhalable  Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable  Short term exposure, Systemic, Dermal  Short term exposure, Systemic,	Not applicable.  Not evaluated.  Not applicable  Not applicable	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.  Not applicable.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL
Inhalable  Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable  Short term exposure, Systemic, Dermal  Short term exposure, Systemic, Inhalable  Short term exposure, Systemic,	Not applicable.  Not evaluated.  Not applicable  Not applicable  Not applicable  Not applicable	Not applicable.  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.  Not applicable.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.  Since the substance is not classified for acute effects and therefore, no acute DNEL

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

# Section 4:: Guidance to check compliance with the exposure scenario

Environment Not available.
Health Not available.

# Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b



### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# 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: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 4033

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 300

Environment factors not influenced by risk management:

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

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

Organisational measures to prevent/limit release from site:

(%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not available

4840

Not available.

7 36x10-4

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.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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.

4650 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Frequency and duration of use:

220 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

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

Not available.

Continuous release.

1000

1000

7.36x10-4

Not available

Not available.

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release: Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% 46.5 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day):

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

Not available.

300

5.00x10-4

1 00x10-2

5.00x10-3

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

No air emission controls required; required removal efficiency is 0%.

Soil emission controls are not applicable as there is no direct release to soil.

Not available.

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

(%):

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day):

Frequency and duration of use: Continuous release

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

4840

Not available

7.36x10-4

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%.

=>37.4

Not available.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

> ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 223/291

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 232 Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to 1.00x10-3 RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

Not available.

300

7.36x10-4

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%.

=>37 4

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500 Maximum daily site tonnage (kg/day): 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: 1000 Local marine water dilution factor: 1000

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

None. Other given operational conditions affecting environmental Release fraction to air from process (initial release prior to 7.36x10-4 Release fraction to soil from process (initial release prior to 1.00x10-3 Release fraction to wastewater from process (initial release 1.00x10-3 prior to RMM): Not available. Release fraction to air from wide dispersive use (regional Not available. Release fraction to soil from wide dispersive use (regional only): Release fraction to wastewater from wide dispersive use: Not available Technical conditions and measures at process level (source) to Not applicable. 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) =>37 4

Not available.

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

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 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

only): Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Not available.

7 36x10-4

Not available

Not available. Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Treat air emission to provide a typical removal efficiency of

No air emission controls required; required removal efficiency is 0%.

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

No wastewater treatment required.

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environment factors not influenced by risk management:

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

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

1860

None

5.00x10-3

0.01

Not available.

Not available

Not available.

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

=>37.4

Not available

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b 226/291 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

Not applicable.

containers at non-dedicated facilities

**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:

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

Local exhaust ventilation should be provided. with a minimum efficacy of 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Non industrial spraying

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Avoid carrying out operation for more than 4 hours.

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

# **Section 3:: Exposure estimation**

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Value

	day	exposure estimation kg/day	
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]

Concentration in sewage (PECstp)

Concentration in sewage sludge

mg/kg dwt

Not applicable as there is no release to wastewater.

Release from point source

Not applicable as there is no release to wastewater.

**Justification EUSES** calculation

Total release for regional

**EUSES** calculation

**Local concentration** 

PEC aquatic (local+regional) 4 37x10-4

**Justification** 

Justification

Fresh water mg/l 0 **FUSES** calculation Marine water mg/l 0 4.34x10-5 **EUSES** calculation Not applicable. Intermittent release. mg/l Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. 0.221 **EUSES** calculation Not evaluated. 0.022 **EUSES** calculation

Marine water sediment mg/kg dwt Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation 0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** Not evaluated. **EUSES** calculation During emission mg/m³ 0 3.94x10-10 Annual average mg/m³ **EUSES** calculation Annual deposition mg/m²/d 0 **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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
Waste water Surface water air (direct + STP)	day 0.388 Not evaluated. 0	19.2 4.8 30.3	EUSES calculation EUSES calculation EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Process Category: PROC08a, PROC11
Substance supplied to that use in form of: In a mixture

stance 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, ERC07, ERC08a, ERC08b, ERC08c,

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 4: Metal working fluids

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

Release from point source

(local exposure estimation) kg/

Total control de la control de			thulanaminaa in anan nyaa
Grassland averaged mg/kg dwt	3.24x10 <sup>-4</sup>	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.64x10 <sup>-4</sup>	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	1.92x10 <sup>-4</sup>	2.36x10 <sup>-4</sup>	EUSES calculation
Fresh water mg/l	1.20x10 <sup>-4</sup>	5.58x10 <sup>-4</sup>	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
mg/l	400	FUCEC adaption	
Concentration in sewage (PECstp)	0.121	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]
air (direct + STP)	0.0285	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	0.388	19.2	EUSES calculation
	day		

Tetraethylenepentamine, TEPA

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** 

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, ERC07, ERC08a, ERC08b, ERC08c,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.70x10<sup>-4</sup> **EUSES** calculation PEC air (local+regional) Justification **Local concentration** 7.93x10<sup>-6</sup> Not evaluated. EUSES calculation During emission mg/m<sup>3</sup> 6.52x10<sup>-6</sup> 6 52x10<sup>-6</sup> EUSES calculation Annual average mg/m<sup>3</sup> 1.38x10<sup>-5</sup> 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 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10 <sup>-3</sup>	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10 <sup>-3</sup>	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10 <sup>-3</sup>	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10 <sup>-6</sup>	4.38x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	1.22x10 <sup>-6</sup>	4.46x10 <sup>-5</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10 <sup>-5</sup>	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10 <sup>-5</sup>	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10 <sup>-7</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10 <sup>-7</sup>	4.86x10 <sup>-7</sup>	EUSES calculation
Annual deposition mg/m²/d	1.03x10 <sup>-6</sup>	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

# Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	<b>EUSES</b> calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	<b>EUSES</b> calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

PEC sediment (local+regional) **Justification Local concentration** Fresh water sediment mg/kg dwt 0.221 Not evaluated **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** 7.73x10<sup>-5</sup> 0.077 Agricultural soil averaged mg/kg **EUSES** calculation Grassland averaged mg/kg dwt 1.53x10<sup>-4</sup> 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10<sup>-4</sup> **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** 5.11x10<sup>-6</sup> During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 3.08x10<sup>-6</sup> 3.08x10<sup>-6</sup> **EUSES** calculation Not evaluated. **EUSES** calculation Annual deposition mg/m²/d 6.52x10<sup>-6</sup> **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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23[ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	3.19x10 <sup>-3</sup>	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	4.82	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.17x10 <sup>-6</sup>	4.40x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	3.17x10 <sup>-6</sup>	4.66x10 <sup>-5</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.222	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	2.00x10 <sup>-12</sup>	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.96x10 <sup>-12</sup>	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.96x10 <sup>-14</sup>	Not evaluated.	EUSES calculation
Annual average mg/m³	7.96x10 <sup>-14</sup>	3.94x10 <sup>-10</sup>	EUSES calculation
Annual deposition mg/m²/d	1.69x10 <sup>-13</sup>	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

### Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

Route of exposure **Contributing scenarios Dose/Concentration Justification** 

Long term exposure, Systemic,

**Dermal** 

Not applicable.

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

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Not applicable. Not applicable. Long term exposure, Local, Dermal Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Non industrial spraying Justification **Route of exposure Contributing scenarios Dose/Concentration** The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 Not applicable. 0.30 The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 Not applicable. Long term exposure, Systemic, Not applicable. Combined Not applicable. Long term exposure, Local, Dermal Not evaluated Not applicable. Since the substance is not classified for Long term exposure, Local, Not applicable Not applicable.

Inhalable acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable

Dermal acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for

Inhalable acute effects and therefore, no acute DNEL

has been derived.

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.

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.

1.22 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable.

Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

exposure estimates for other PROC are

below this value

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

# Section 4:: Guidance to check compliance with the exposure scenario

Environment Not available.
Health Not available.

# Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Tetraethylenepentamine, TEPA

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, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b



### Annex to the extended Safety Data Sheet (eSDS)

Industrial

#### Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

# Section 2:: Operational conditions and risk management measures

Section 2.1:	Control of	f environmental	exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% Annual site tonnage (tonnes/year): 186 Average Local Daily Tonnage (kg/day): 510

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Not available.

7 36x10-4

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 applicable as there is no release to wastewater.

Not available.

Prevent discharge of undissolved substance to or recover from onsite wastewater

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg Human factors not influenced by risk management:

Not applicable.

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity Personal protection:

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: 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

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 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.

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg Human factors not influenced by risk management:

Not applicable.

Not applicable.

Indoor, industrial setting

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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)

Personal protection:

**Product characteristics:** Liquid. Covers concentrations up to 2%

**Amounts used:** Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: 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

Not applicable.

Other given operational conditions affecting workers

exposure:

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be

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).

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Not applicable.

Indoor. industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:
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

# **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	<b>day</b> 0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	4.69x10-4	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.27x10-6	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.48x10-6	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.30x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	1.30x10-7	1.31x10-7	EUSES calculation
Annual deposition mg/m²/d	2.76x10-7	Not evaluated.	EUSES calculation
1	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

(multistage and/or significant contac 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 and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	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 est Contributing scenario controlling wo		n 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 and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	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.

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived 1.22 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to 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, 0.305 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 and Not evaluated. Not applicable. Combined Long term exposure, Local, Dermal Not applicable and Not evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 0.61 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.055 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable and Not evaluated. Not applicable. Not applicable. Long term exposure, Systemic, Combined Tetraethylenepentamine, TEPA 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 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
ong term exposure, Local, nhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, nhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, nhalable	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

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 and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local,	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

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 and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	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

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be expected

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, 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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, 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 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.

Tetraethylenepentamine, TEPA

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



### Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

# Section 2:: Operational conditions and risk management measures

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% Annual site tonnage (tonnes/year): 186 Average Local Daily Tonnage (kg/day): 510

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

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 applicable as there is no release to wastewater.

Not available.

7 36x10-4

Not available.

Not available.

Not available.

Prevent discharge of undissolved substance to or recover from onsite wastewater

### Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Assumed on-site sewage treatment plant flow (m³/d): 2000

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable. Frequency and duration of use:

Continuous release. Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Indoor. industrial setting

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 0.5%

**Amounts used:** Not applicable. Frequency and duration of use:

Continuous release. 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.

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:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Continuous release.

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.

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

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

Indoor, industrial setting

Not applicable.

Not applicable.

Not applicable.

containers at dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable. Frequency and duration of use: Continuous release.

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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,

Not applicable.

including weighing)

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

**Amounts used:** 

Frequency and duration of use: Continuous release. 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

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Indoor, industrial setting

Not applicable.

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

**Amounts used:** Not applicable. Frequency and duration of use: Continuous release.

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.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

Not applicable.

Not applicable. dispersion and exposure:

Personal protection: 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.

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Continuous release.

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:

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 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: Continuous release.

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	4.69x10-4	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

0.077 Agricultural soil averaged mg/kg 3.27x10-6 **EUSES** calculation dwt Grassland averaged mg/kg dwt 0.077 6 48x10-6 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation Local concentration PEC air (local+regional) Justification During emission mg/m<sup>3</sup> 1.30x10-7 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1.30x10-7 1 31x10-7 **EUSES** calculation Annual deposition mg/m<sup>2</sup>/d 2 76x10-7 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)

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, Not applicable. Inhalable

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 Long term exposure, Local,

Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

Inhalable Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

**Dermal** 

Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Inhalable 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.

1.52

Not applicable.

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: Calendering operations

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, Not applicable. 0.76 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

**Dermal** 

Long term exposure, Local, Dermal Long term exposure, Local, Inhalable

Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. The ECETOC TRA tool has been used to Not applicable. Short term exposure, Local, 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **Route of exposure Contributing scenarios Justification Dose/Concentration** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to 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 and Not evaluated. Not applicable. Combined Long term exposure, Local, Dermal Not applicable and Not evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, 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 Not applicable. Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to 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 Tetraethylenepentamine, TEPA 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.

249/291

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, The ECETOC TRA tool has been used to Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.027 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. 0.76 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. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Short term exposure, Local, Dermal Not applicable. Not applicable. Short term exposure, Local, Not applicable. The ECETOC TRA tool has been used to 1 52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 5: Roller application or brushing

Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to

**Dermal** 

Long term exposure, Systemic, Not applicable. 0.027

estimate workplace exposures unless

otherwise indicated. The PROC with the highest exposure level is given since the

exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Not applicable. 0.76 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 and Not evaluated. Not applicable. Not applicable.

**Long term exposure, Local, Dermal** Not applicable and Not evaluated. Not applicable. Not applicable.

Tetraethylenepentamine, TEPA 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, ERC02, ERC04, 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 Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable Not applicable. Since the substance is not classified for Short term exposure, Systemic, acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

**Route of exposure Contributing scenarios Dose/Concentration** Justification The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Not applicable. Not applicable. Not applicable.

Short term exposure, Systemic, Dermal

Short term exposure, Systemic,

Short term exposure, Systemic,

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable. Not applicable. Not applicable.

Short term exposure, Local, Dermal Not applicable. Short term exposure, Local,

Inhalable

Not applicable.

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 7: Using material as fuel sources, limited exposure to unburned product to be

expected

Inhalable

Combined

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

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

Long term exposure, Systemic, Not applicable. 0.76 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Not applicable. Not applicable. Not applicable. Long term exposure, Local, Dermal Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. 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

### Section 4:: Guidance to check compliance with the exposure scenario

Environment Not available.
Health Not available.

# Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

below this value



### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

#### Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

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, ERC10b

### Section 2:: Operational conditions and risk management measures

Section 2.1:	Control of	environmental	exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% Annual site tonnage (tonnes/year): 186 Average Local Daily Tonnage (kg/day): 510

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

**Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Continuous release.

365

7 36x10-4

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 applicable as there is no release to

wastewater

Not available.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

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, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Mixing or blending in batch processes for formulation of preparations\* and articles

(multistage and/or significant contact)

**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:

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:

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.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers

exposure:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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 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:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

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, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Human factors not influenced by risk management: Indoor. professional setting

Not applicable.

Not applicable.

Other given operational conditions affecting workers

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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,

Not applicable.

Not applicable.

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. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

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

**Product characteristics:** Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor, professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Use the following local exhaust ventilation types: Treat air emission to provide a typical

removal efficiency of (%): 90%

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

> 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, ERC10b

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be

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).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Indoor. professional setting

Not applicable.

Not applicable.

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	4.69x10-4	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	3.27x10-6	0.077	EUSES calculation
Grassland averaged mg/kg dwt	6.48x10-6	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	1.30x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	1.30x10-7	1.31x10-7	EUSES calculation
Annual deposition mg/m²/d	2.76x10-7	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

> 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, ERC10b

Section 3:.2 Workers - Exposure est Contributing scenario controlling we (multistage and/or significant contact	orker exposure for 0: Mixing or b	lending in batch processes for fo	rmulation of preparations* and articles
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		g operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local,	Not applicable.  Not applicable.	Not applicable. Not applicable.	Not applicable.  Not applicable.
Inhalable	тос арриоавіс.	тчог арриоавіс.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling we containers at non-dedicated facilitie	orker exposure for 2: Transfer of	substance or preparation (chargi	ng/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.110	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	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.
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Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

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, ERC10b

Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. 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, 0.61 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 **Contributing scenarios Dose/Concentration Justification** Route of exposure Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. **Dermal** Not applicable. Long term exposure, Systemic, 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 Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Dermal Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, 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 Not applicable. Not applicable. Not applicable. Long term exposure, Local, Dermal Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Not applicable. Short term exposure, Systemic, Not applicable. Not applicable. Inhalable Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Local, Dermal

Short term exposure, Local,

Inhalable

Not applicable.

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 2% - Professional Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

Not applicable.

Not applicable.

Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 3:.2 Workers - Exposure est		and an analysis of the same	
Contributing scenario controlling wo		•	
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 and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	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, nhalable	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

Contributing scenario controlling worker exposure for 6: Using material as fuel sources, limited exposure to unburned product to be expected

Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC10

Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Sector of end use: SU22 Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, 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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Tetraethylenepentamine, TEPA

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: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

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, ERC10b



### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

#### Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

### Section 2:: Operational conditions and risk management measures

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% Annual site tonnage (tonnes/year): 186 Average Local Daily Tonnage (kg/day): 510

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

**Emission Days (days/year):** 365

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release: Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of

(%): Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

7 36x10-4

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.

Tetraethylenepentamine, TEPA

**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, ERC02, ERC04, ERC10b

Conditions and measures related to municipal sewage treatment plant:

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 0: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at non-dedicated facilities

**Product characteristics:** Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management: Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

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 day **Waste water** 0 19.2 **EUSES** calculation **Surface water** Not evaluated. 48 **EUSES** calculation **EUSES** calculation air (direct + STP) 4 69x10-4 30.3 Soil (direct releases only) Not evaluated. Table R16.23 [ REACH ] n **Justification** Value Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. ma/l Concentration in sewage sludge Not applicable as there is no **EUSES** calculation release to wastewater. mg/kg dwt **Justification** Local concentration PEC aquatic (local+regional) Fresh water mg/l O 4.37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation Not applicable. Intermittent release. mg/l Not applicable. Not applicable. Local concentration PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.221 Marine water sediment mg/kg dwt Not evaluated. 0.022 EUSES calculation Local concentration Justification PEC soil (local+regional) Agricultural soil averaged mg/kg 3.27x10-6 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 6 48x10-6 0.077 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated. 7.69x10-4 PEC air (local+regional) **Local concentration Justification** During emission mg/m<sup>3</sup> 1.30x10-7 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 1 30x10-7 1 31x10-7 **EUSES** calculation Annual deposition mg/m²/d 2 76x10-7 Not evaluated. **FUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Tetraethylenepentamine, TEPA

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, ERC02, ERC04, ERC10b

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 **Contributing scenarios Dose/Concentration Justification** Route of exposure The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Long term exposure, Systemic, Not applicable and Not evaluated. Not applicable.

Combined

Not applicable.

Not applicable and Not evaluated. Not applicable. Not applicable.

Not applicable. Since the substance is not classified for

Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

0.76

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL

Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for

acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Not applicable.

1.52

The ECETOC TRA tool has been used to estimate workplace exposures unless

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

below this value

Not applicable.

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Section 4:: Guidance to check compliance with the exposure scenario

Environment Not available.

Health Not available.

Section 5. Remarks: Additional good practice advice beyond the REACH CSA

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.

Long term exposure, Systemic,

Long term exposure, Local, Dermal

Inhalable



#### Annex to the extended Safety Data Sheet (eSDS)

**Professional** 

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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: ERC11a

### Section 2:: Operational conditions and risk management measures

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 4033 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available.

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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.

7.36x10-4

Not available.

Not available.

Not available.

Not applicable.

Tetraethylenepentamine, TEPA

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: ERC11a

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

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 7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Not available. Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

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 available.

Not applicable.

Not available

No wastewater treatment required.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860

25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

220 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Tetraethylenepentamine, TEPA

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: ERC11a

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

prevent release:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 186 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

Maximum daily site tonnage (kg/day): 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 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Continuous release.

300

5.00x10-4

1.00x10-2

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

Tetraethylenepentamine, TEPA

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: ERC11a 266/291 Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

plant:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

plant:

Not applicable.

Continuous release.

7.36x10-4

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%.

=>37.4

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Conditions and measures related to municipal sewage treatment

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% 232 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Tetraethylenepentamine, TEPA

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: ERC11a

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant:

1.00x10-3

7.36x10-4

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%.

=>37 4

Not available

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840

Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use:

220 Emission Days (days/year):

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 RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

only): Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Not applicable.

Not available.

Continuous release.

7.36x10-4

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%.

Tetraethylenepentamine, TEPA

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: ERC11a

Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available.

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

1000 Local freshwater dilution factor: Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None.

Release fraction to air from process (initial release prior to

RMM):

exposure:

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

5580

7.36x10-4

Not available.

Not available.

Not available

Not applicable.

Not available.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

No wastewater treatment required.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally:

465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 1274

Maximum daily site tonnage (kg/day): Not available

Tetraethylenepentamine, TEPA

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: ERC11a

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 None

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: 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 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1000

365

5.00x10-3

0.01

Not available

Not available.

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%.

=>37.4

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 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 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:

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:

Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Indoor, professional setting

Not applicable.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

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: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not applicable	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 0 Not evaluated. **EUSES** calculation 0 3.94x10-10 **EUSES** calculation Annual average mg/m³ 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	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: Metal working fluids

Release from point source

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Total release for regional

**Justification** 

## Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	

Tetraethylenepentamine, TEPA

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

Concentration in sewage (PECstp) 0.121 **EUSES** calculation Concentration in sewage sludge 183 **EUSES** calculation mg/kg dwt Local concentration PEC aquatic (local+regional) Justification Fresh water mg/l 1.20x10-4 5.58x10-4 **EUSES** calculation Marine water mg/l 1.92x10-4 2.36x10-4 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.282 Marine water sediment mg/kg dwt Not evaluated. 0.119 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification **EUSES** calculation Agricultural soil averaged mg/kg 1.64x10-4 0.077 Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation PEC air (local+regional) Local concentration **Justification** During emission mg/m<sup>3</sup> 7.93x10-6 Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 6.52x10-6 6.52x10-6 **EUSES** calculation Annual deposition mg/m²/d 1.38x10-5 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 6: Lube oil use

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10 <sup>-7</sup>	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: Use of coatings and adhesives

Release from point source

	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not applicable	0.022	EUSES calculation
Fresh water sediment mg/kg dwt	Not applicable	0.221	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	0	4.34x10 <sup>-5</sup>	EUSES calculation
Fresh water mg/l	0	4.37x10 <sup>-4</sup>	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
	Value	Justification	
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
air (direct + STP)	0	30.3	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
Waste water	<b>day</b> 0	19.2	EUSES calculation
	(local exposure estimation) kg/	exposure estimation kg/day	

Tetraethylenepentamine, TEPA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 0.5% -Industrial

**Justification** 

Process Category: PROC21, PROC24

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC11a

During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation PEC aquatic (local+regional) Justification **Local concentration** 

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure est Contributing scenario controlling we		ergy manipulation of substances	bound in materials and/or articles
Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	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 evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.12	The ECETOC TRA tool has been used to estimate workplace exposures unless

Section	2. 2	Morkore	Evnocuro	estimation
Section	JZ	vvoikeis .	- Exposure	esumation

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Route of exposure	Contributing scenarios	<b>Dose/Concentration</b>	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.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
	Not applicable.	Not applicable.	Not applicable.

Tetraethylenepentamine, TEPA

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

otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC11a

Short term exposure, Systemic, Combined

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Local, Inhalable

Not applicable.

Not applicable. 0.12

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.



**Professional** 

#### Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

**Product definition** Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

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: ERC11a

#### Section 2:: Operational conditions and risk management measures

#### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 4033 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day):

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

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available

Not available.

Continuous release.

300

7.36x10-4

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.

Tetraethylenepentamine, TEPA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% . Industrial

Sector of end use: SU22

Process Category: PROC21, PROC24

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC11a 278/291 Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 1: Use as an epoxy curing agent

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4650 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1160 Average Local Daily Tonnage (kg/day): 5273

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environment factors not influenced by risk management:

1000 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 7.36x10-4

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

only):

Not available. Release fraction to wastewater from wide dispersive use: Not applicable.

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available

No wastewater treatment required.

Not available.

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent in paint

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 2114

Maximum daily site tonnage (kg/day): Not available Frequency and duration of use: Continuous release.

220 **Emission Days (days/year):** 

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental

exposure:

None

Tetraethylenepentamine, TEPA

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: ERC11a

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not available.

7.36x10-4

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: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 46.5 Average Local Daily Tonnage (kg/day): 155

Maximum daily site tonnage (kg/day): Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environment factors not influenced by risk management:

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

RMM): Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release: Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not applicable.

186

Not available.

5.00x10-4

1.00x10-2

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

Tetraethylenepentamine, TEPA

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: 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 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

**Product characteristics:** 

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: Local marine water dilution factor: 1000 None. Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use: Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge)

to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

Conditions and measures related to municipal sewage treatment

Not applicable.

Continuous release.

1000

7.36x10-4

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%.

=>37.4

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

plant:

Not available.

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 930 Fraction of Regional tonnage used locally: 25% 232 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 773

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environment factors not influenced by risk management:

Tetraethylenepentamine, TEPA

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: ERC11a

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None

exposure:

Release fraction to air from process (initial release prior to RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%): If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

1.00x10-3

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%.

=>37 4

Not available

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics:

Amounts used:

Fraction of EU tonnage used in region: Regional use tonnage (tonnes/year): 4840

Fraction of Regional tonnage used locally: 1210 Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Maximum daily site tonnage (kg/day): 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 RMM):

Release fraction to soil from process (initial release prior to RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

only): Release fraction to soil from wide dispersive use (regional

only): Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Not applicable.

Not available.

Continuous release.

220

None

7.36x10-4

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%.

Tetraethylenepentamine, TEPA

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: ERC11a

Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 3 (%):

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

### Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364

Maximum daily site tonnage (kg/day): Not available. Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

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

exposure:

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 3 (%):

If discharging to domestic sewage treatment plant, provide

the required onsite wastewater removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

5580

None.

7.36x10-4

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 8: Use of coatings and adhesives

Operational conditions: Indoor use.

**Product characteristics:** Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: 465 Annual site tonnage (tonnes/year):

Average Local Daily Tonnage (kg/day): 1274 Maximum daily site tonnage (kg/day): Not available

Tetraethylenepentamine, TEPA

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: ERC11a

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 Local marine water dilution factor: 1000 None

Other given operational conditions affecting environmental exposure:

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: 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 3 (%):

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of <sup>3</sup> (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

365

Release fraction to air from process (initial release prior to

5.00x10-3

0.01

Not available

Not available.

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%.

=>37.4

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 m<sup>3</sup>/d Default Body weight: Workers: 70 kg

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

**Personal protection:** Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Product characteristics:** Solid. Covers concentrations up to 2%

Amounts used: Not applicable. Frequency and duration of use:

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:

from source towards the worker:

Technical conditions and measures to control dispersion

Organisational measures to prevent/limit releases,

dispersion and exposure:

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.

Tetraethylenepentamine, TEPA

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: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	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 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

**Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 0 Not evaluated. **EUSES** calculation 0 3.94x10-10 **EUSES** calculation Annual average mg/m³ 0 Annual deposition mg/m²/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not applicable	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	0	Not evaluated.	EUSES calculation
Annual average mg/m³	0	3.94x10-10	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	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: Electroplating.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation

Tetraethylenepentamine, TEPA

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: ERC11a

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Marine water mg/l	1.92x10-4	2.36x10-4	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.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	<b>EUSES</b> calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	6.24x10-11	0.077	EUSES calculation
Annual average mg/m³	1.24x10-10	0.077	EUSES calculation
Annual deposition mg/m²/d	Not evaluated.	7.69x10-4	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: Metal working fluids

Release from point source

	(local exposure estimation) kg/day	exposure estimation kg/day	
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.036	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	54.6	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
Marine water mg/l	5.73x10-5	1.01x10-4	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.	0.239	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	9.02x10-13	Not evaluated.	EUSES calculation
Annual average mg/m³	5.43x10-13	3.95x10-10	EUSES calculation
Annual deposition mg/m²/d	1.15x10-12	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 5: Corrosion inhibitor.

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0.388	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.0285	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	

Tetraethylenepentamine, TEPA

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of preparations containing EA up to 2% -. Industrial

**Justification** 

Total release for regional

Process Category: PROC21, PROC24 Sector of end use: SU22

Concentration in sewage (PECstp) 0.121 **EUSES** calculation Concentration in sewage sludge 183 **EUSES** calculation mg/kg dwt Local concentration PEC aquatic (local+regional) Justification Fresh water mg/l 1.20x10-4 5.58x10-4 **EUSES** calculation Marine water mg/l 2.36x10-4 **EUSES** calculation 1.92x10-4 Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.282 Marine water sediment mg/kg dwt Not evaluated. 0.119 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation PEC air (local+regional) Local concentration **Justification** During emission mg/m<sup>3</sup> 7.93x10-6 Not evaluated. **EUSES** calculation 6.52x10-6 6.52x10-6 Annual average mg/m<sup>3</sup> **EUSES** calculation Annual deposition mg/m²/d 1.38x10-5 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration** Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

### Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	3.94x10-3	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	2.9x10-3	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Table R16.23 [ REACH ]
	Value	Justification	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.22x10-6	4.38x10-4	EUSES calculation
Marine water mg/l	1.22x10-6	4.46x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.023	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.22x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	8.06x10-7	Not evaluated.	EUSES calculation
Annual average mg/m³	4.86x10-7	4.86x10-7	EUSES calculation
Annual deposition mg/m²/d	1.03x10-6	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 7: Processing aid

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10-4	EUSES calculation
Marine water mg/l	0	4.34x10-5	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.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	7.73x10-5	0.077	EUSES calculation
Grassland averaged mg/kg dwt	1.53x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	5.11x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	3.08x10-6	3.08x10-6	EUSES calculation
Annual deposition mg/m²/d	6.52x10-6	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 8: 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	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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	4.37x10 <sup>-4</sup>	EUSES calculation
Marine water mg/l	0	4.34x10 <sup>-5</sup>	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.221	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	0	0.077	EUSES calculation
Grassland averaged mg/kg dwt	0	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification

Tetraethylenepentamine, TEPA

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: ERC11a

During emission mg/m<sup>3</sup> Not evaluated. **EUSES** calculation Annual average mg/m<sup>3</sup> 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d 0 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2 World	ers - Exposure	estimation
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Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

**Contributing scenarios Dose/Concentration** Route of exposure

Long term exposure, Systemic,

**Dermal** 

Not applicable. 0.0003

**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.

0.02

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

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 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 estimation

Contributing scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles

**Route of exposure Contributing scenarios Dose/Concentration** Justification

Long term exposure, Systemic, **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 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, Not applicable

Dermal

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Tetraethylenepentamine, TEPA

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: ERC11a

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.

0.03

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 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.