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.

Identified uses

Consumer uses of ethyleneamines

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

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

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

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

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

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

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

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

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

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

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

Use of preparations containing EA up to 15% - Industrial

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

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

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

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

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

Use of preparations containing EA up to 2% - Professional

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

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

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

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

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

1.3 Details of the supplier of the safety data sheet

DELAMINE B.V. Barchman Wuytierslaan 10 3818 LH Amersfoort The Netherlands Tel.:31-334676897

e-mail address of person responsible for this SDS

: SDS.Delamine@delamine.com

1.4 Emergency telephone number

Supplier

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

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.

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

2.2 Label elements

Hazard pictograms





Signal word : Danger

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SECTION 2: Hazards identification

Hazard statements

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

Response

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

Storage

Store locked up.

Disposal

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

Supplemental label elements

: Not applicable.

2.3 Other hazards

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

: No.

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

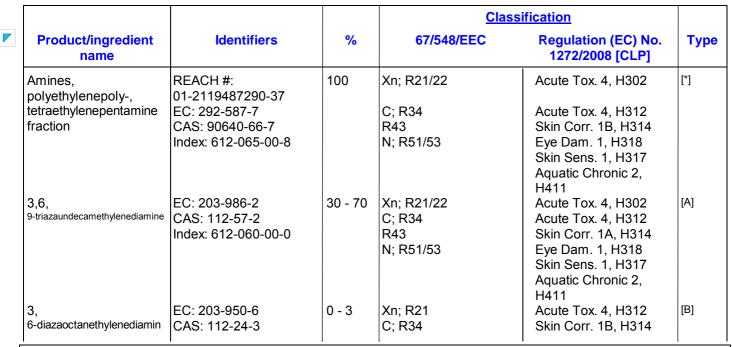
: No.

Other hazards which do not result in classification : None known.Not applicable.

SECTION 3: Composition/information on ingredients

Substance/mixture

Multi-constituent substance



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SECTION 3: Composition/information on ingredients

Index: 612-059-00-5	1	R43 R52/53	Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	
	1	See Section 16 for the full text of the R- phrases declared above.	See Section 16 for the full text of the H statements declared above.	

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

Type

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

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact

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

Inhalation

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

Skin contact

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

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

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

Tetraethylenepentamine, TEPA

SECTION 4: First aid measures

Potential acute health effects

Eye contact : Causes serious eye damage.

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

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

effects may be delayed following exposure.

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

reaction.

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

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:

> 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.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing

media

: Use an extinguishing agent suitable for the surrounding fire. Dry sand or other suitable

absorbent. Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing

media

: Halones

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst. This material is 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 combustion products

: Decomposition products may include the following materials:

carbon dioxide carbon monoxide nitrogen oxides

chemical incidents.

5.3 Advice for firefighters

fighters

Special precautions for fire- : 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

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

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

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

For emergency responders

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

6.2 Environmental precautions

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

6.3 Methods and 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.

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.

SECTION 7: Handling and storage

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.

7.3 Specific end use(s)

Recommendations : Industrial sector specific : solutions

No specific data.No specific data.

SECTION 8: Exposure controls/personal protection

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

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures

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

Derived effect levels

Product/ingredient name	Туре	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/m ³	Workers	Systemic
	DNEL	Long term Dermal	0.036 mg/ cm ²	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 ²	Consumers	Local
	DNEL	Long term Dermal	0.32 mg/ kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	0.38 mg/m³	Consumers	Systemic
	DNEL	Long term Oral	0.53 mg/ kg bw/day	Consumers	Systemic

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SECTION 8: Exposure controls/personal protection

DNEL	Long term Dermal	0.56 mg/	Consumers	Local	l
		cm²			ı

Predicted effect concentrations

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

Hygiene measures

: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

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

Skin protection Hand protection

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

Body protection

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

Other skin protection

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

Respiratory protection

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

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Liquid.

Colour Off-white. Clear. **Odour** : Odourless. : Not available. **Odour threshold**

: 13.5

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

Initial boiling point and boiling

range

: 375°C

Flash point : Closed cup: 177°C **Evaporation rate** Not available. Flammability (solid, gas) : Not applicable. **Burning time** : Not applicable. **Burning rate** : Not applicable.

Upper/lower flammability or

explosive limits

: Not available.

: <0.001 kPa [room temperature] Vapour pressure

Vapour density : 6.5 [Air = 1] 0.991 to 0.9994 **Relative density**

Solubility(ies)

>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

No additional information.

SECTION 10: Stability and reactivity

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

10.2 Chemical stability : The product is stable.

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

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.

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SECTION 10: Stability and reactivity

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.

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.

Sensitiser

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.

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SECTION 11: Toxicological information

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

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.

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

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

reaction.

Eye contact : Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : Adverse symptoms may include the following:

stomach pains

Skin contact: Adverse symptoms may include the following:

pain or irritation

redness

blistering may occur

Eye contact : Adverse symptoms may include the following:

pain watering redness

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

Short term exposure

Potential immediate

effects

: No specific data.

Potential delayed effects: No specific data.

Long term exposure

Potential immediate

No specific data.

effects

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
Indutori	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.

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SECTION 11: Toxicological information

Metabolism: Rapidly metabolised.Elimination: Rapidly excreted.Other information: No specific data.

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	LogP _{ow}	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.

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SECTION 13: Disposal considerations

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

13.1 Waste treatment methods

Product

Methods of disposal

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

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

Methods of disposal

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

Special precautions

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

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	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.	Yes.
14.6 Special precautions for user	Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	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.	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.	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.

Date of issue/Date of revision : 7 September 2012

SECTION 14: Transport information

Additional information	Hazard identification	-	Emergency	Passenger and
information	number 80		schedules (EmS) F-A, S-B	Cargo Aircraft Quantity limitation: 5 L
			1 -A, O-D	Packaging instructions:
	Limited quantity			852
	5 L			Cargo Aircraft Only
				Quantity limitation: 60 L
	Tunnel code			Packaging instructions:
	(E)			856
				<u>Limited Quantities -</u>
				Passenger Aircraft
				Quantity limitation: 1 L
				Packaging instructions:
				Y841

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.

rtone of the componente are noted

Annex XVII - Restrictions

: Not applicable.

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

articles

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed
Priority List Chemicals : Not listed
Integrated pollution : Not listed

prevention and control

list (IPPC) - Air

Integrated pollution prevention and control

list (IPPC) - Water

: Not listed

Chemical Weapons
Convention List Schedule I

Convention List

: Not listed

Chemicals

Chemical Weapons

Convention List Schedule II

Chemicals

: Not listed

Chemical Weapons
Convention List Schedule

III Chemicals

: Not listed

15.2 Chemical Safety

Assessment

: Complete.

Date of issue/Date of revision : 7 September 2012 14/292

SECTION 15: Regulatory information

: Applicable. 15.3 Registration status

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]

DNEL = Derived No Effect Level

EUH statement = CLP-specific Hazard statement PNEC = Predicted No Effect Concentration RRN = REACH Registration Number

Classi	fication		Justification
Acute Tox. 4, H302			Expert judgment
Acute Tox. 4, H312			Expert judgment
Skin Corr. 1B, H314			Expert judgment
Eye Dam. 1, H318			Expert judgment
Skin Sens. 1, H317			Expert judgment
Aquatic Chronic 2, H411			Expert judgment
Full text of abbreviated H	: H302	Harmful if swall	owed.
statements	H312	Harmful in cont	act with skin.
	H314	Causes severe	skin burns and eye damage.
	H317	May cause an a	Illergic skin reaction.
	H318	Causes serious	eye damage.
	H411	Toxic to aquatic	life with long lasting effects.
	H412	Harmful to aqua	atic life with long lasting effects.
Full text of classifications	: Acute To	ox. 4, H302	ACUTE TOXICITY: ORAL - Category 4
[CLP/GHS]	Acute To	ox. 4, H312	ACUTE TOXICITY: SKIN - Category 4

Acute 1 ox. 4, H312 Aquatic Chronic 2, H411 AQUATIC TOXICITY (CHRONIC) - Category 2 Aquatic Chronic 3, H412 AQUATIC TOXICITY (CHRONIC) - Category 3 Eve Dam. 1. H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 Skin Corr. 1A, H314 SKIN CORROSION/IRRITATION - Category 1A Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B SKIN SENSITIZATION - Category 1 Skin Sens. 1, H317

Full text of abbreviated R phrases

R21- Harmful in contact with skin.

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

R34- Causes burns.

R43- May cause sensitisation by skin contact.

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

aquatic environment.

R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the

aquatic environment.

Full text of classifications

[DSD/DPD]

: C - Corrosive Xn - Harmful

N - Dangerous for the environment

Date of issue/ Date of

revision

: 7 September 2012

Date of previous issue

: 8 February 2011

Version : 5

Notice to reader

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

Tetraethylenepentamine, TEPA

SECTION 16: Other information

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.

Date of issue/Date of revision : 7 September 2012 16/292



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 **Assessment Method**

Not applicable.

See Section 3

Section 2: Operational conditions and risk management measures

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 0:

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 1274 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):** Not available.

Environment factors not influenced by risk

management:

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

Other given operational conditions affecting

environmental exposure:

Release fraction to air from process (initial release prior Not available

to RMM):

Release fraction to soil from process (initial

release prior to RMM):

Not available.

Release fraction to wastewater from process (initial

release prior to RMM):

Not available

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):

Not available.

Assumed domestic sewage treatment plant flow (m³/d): 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 g
- Covers exposure up to 5 minutes/event

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

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

Operations Conditions (consumer):

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

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

Section 3: Exposure estimation and reference to its source

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0:

	Release from point source	Total release for regional	Justification
	(local exposure estimation) kg/day	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	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	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.024	EUSES calculation

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.

Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 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 Justification PEC air (local+regional) **EUSES** calculation During emission mg/m³ 7 96x10-14 Not evaluated. **EUSES** calculation Annual average mg/m³ 7 96x10-14 3 94×10-10 Annual deposition mg/m²/d 1 69x10-13 Not evaluated **EUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Not applicable. Not applicable. Micro-organism mg/l 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:

25%; 5%; 25%; 5%

Scenario: substance in the

3; 3; 2; 2

article::

60 kg

ConsExpo 4.1

Exposure estimation and reference to its source - Consumers: 0:

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

Adhesives, sealants -

Fillers, putties, plasters, modelling clay - Application(s)

Inhalation:

Mode of release: evaporation

Exposure estimation and reference to its source -

Consumers: 1:

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

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

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

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

Scenario Molecular (Update model):

weight (g/mole):

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

Dermal:

Application methods: instant

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/m³ Dermal load (mg/cm2): Dermal External dose (mg/kg Dermal (Internal dose) mg/kg

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

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

bw/day: m³ (Short term exposure): (external dose) with gloves term exposure: (90% efficiency) mg/kg bw/day

(Long term exposure): 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 Article category related to subsequent service life: Not applicable.

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional guidanceNot 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 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: Cor	trol 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: 4840 Regional use tonnage (tonnes/year): 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:

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

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:

Tetraethylenepentamine, TEPA

Treat air 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.

Continuous release.

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.

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: Not applicable

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 4650 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1160 5273 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 Local marine water dilution factor: 1000

Other given operational conditions affecting environmental

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

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

prevent release:

Technical on-site conditions and measures to reduce or limit

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

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) No wastewater treatment required.

None.

Not available

Not available

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 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% 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:

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 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

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

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% 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.

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

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

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.

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.

=>37.4

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

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:

Not available 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 5500 Average Local Daily Tonnage (kg/day):

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

Emission Days (days/year):

Environment factors not influenced by risk management:

Local freshwater dilution factor: 1000 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:

Treat air emission to provide a typical removal efficiency of

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

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

plant:

4840

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

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

If discharging to domestic sewage treatment plant, provide

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 5: Corrosion inhibitor.

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): 930 25% Fraction of Regional tonnage used locally: 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.

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

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 1 00x10-3

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

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.

7.36x10-4

Not available.

0.01

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 (%):

If discharging to domestic sewage treatment plant, provide

Not available. the required onsite wastewater removal efficiency of ³ (%):

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

Section 2.1: Control of environmental exposure

discharges, air emissions and releases to soil:

Contributing scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

only):

Fraction of EU tonnage used in region: Not available.

4840 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: Continuous release.

220 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 7.36x10-4

Release fraction to soil from process (initial release prior to 1.00x10-3

RMM): 1.00x10-3 Release fraction to wastewater from process (initial release

prior to RMM): Release fraction to air from wide dispersive use (regional Not available.

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

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

Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil:

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

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 (%):

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

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:

5580 Regional use tonnage (tonnes/year): 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): Continuous release Frequency and duration of use:

Emission Days (days/year):

Environment factors not influenced by risk management:

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

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

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 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. 1860 Regional use tonnage (tonnes/year): 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

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): 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

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):

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

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

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

0.01

5.00x10-3

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%.

Not available

=>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 m³/d Default Body weight: Workers: 70 kg

Other given operational conditions affecting workers Indoor. professional setting

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

management supervision controls.

Section 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.

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

Not applicable.

Indoor. professional 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

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	2-1	Environment	- Evnosure	actimation
Section	J		- Exposure	esumation

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

Justification Local concentration PEC soil (local+regional) 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 Justification **Local concentration** PEC air (local+regional) **EUSES** calculation During emission mg/m³ 0 Not evaluated. 0 Annual average mg/m³ 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
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

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	oustineation
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 0.5% - Professional

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** 1.20x10-4 **EUSES** calculation Fresh water mg/l 5.58x10-4 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 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation 7.70x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. Local concentration PEC air (local+regional) **Justification EUSES** calculation During emission mg/m³ 7.93x10-6 Not evaluated. Annual average mg/m³ 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	4.68x10-7	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% -Professional

Justification

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

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

7.96x10-14 Not evaluated. **EUSES** calculation During emission mg/m³ 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.

Contributing scenario controlling we Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.06	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not 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.
Chart term expecure Systemic	Not applicable	Not applicable	Cinco the authorono is not algorified for

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

0.12

has been derived Since the substance is not classified for

Not applicable. acute effects and therefore, no acute DNEL

has been derived. The ECETOC TRA tool has been used to

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

below this value

Short term exposure, Local,

Inhalable

Short term exposure, Local, Dermal Not applicable

Not applicable.

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

	Justification	Dose/Concentration	Contributing scenarios	Route of exposure
xposures unless The PROC with the el is given since the	The ECETOC TRA tool has be estimate workplace exposures otherwise indicated. The PROChighest exposure level is given exposure estimates for other P below this value	0.001	Not applicable.	Long term exposure, Systemic, Dermal
xposures unless The PROC with the el is given since the	The ECETOC TRA tool has be estimate workplace exposures otherwise indicated. The PROChighest exposure level is given exposure estimates for other P below this value	0.06	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.	Not applicable. Not applicable.	Inhalable Short term exposure, Systemic, Dermal Short term exposure, Systemic,

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, Not applicable.

Inhalable

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

Not available. **Environment** Health Not available.

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

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



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

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: 4840 Regional use tonnage (tonnes/year): 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:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site 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.

Continuous release.

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 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1160 5273 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 Local marine water dilution factor: 1000 None.

Other given operational conditions affecting environmental

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

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

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

Not available.

Not available

Not available

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:

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 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:

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

exposure:

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

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:

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:

prevent release:

Fraction of EU tonnage used in region:

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.

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 None.

exposure:

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

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

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

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.

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.

=>37.4

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

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:

Not available 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 5500 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

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 (%):

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

plant:

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

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 5: Corrosion inhibitor.

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): 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.

300 Emission Days (days/year):

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

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):

1 00x10-3

7.36x10-4

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

0.01

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

Not available.

Release fraction to soil from wide dispersive use (regional

Not available

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Not available.

Technical on-site conditions and measures to reduce or limit

Not applicable.

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

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

=>37.4

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

Not available.

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.

4840 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: Continuous release.

220 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 7.36x10-4

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

1.00x10-3

Release fraction to wastewater from process (initial release

1.00x10-3

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

Not available.

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

Not available.

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

Not available.

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

Not applicable.

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

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

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

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

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 (%):

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): 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): Continuous release 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 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):

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:

5580

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.

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. 1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 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): 365

Environment factors not influenced by risk management:

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

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1000

None.

5.00x10-3

0.01

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

Not available

Section 2.2: Control of worker exposure

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

Product characteristics: Solid. Covers concentrations up to 2%

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

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

Other given operational conditions affecting workers 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 1: High (mechanical) energy work-up of substances bound in materials and/or articles

Product characteristics: Solid. Covers concentrations up to 2%

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

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:

Not applicable.

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:

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	2 . 1	Environment	- Evnocuro	actimation
Section	J	Environmen	i - Exposure	esumation

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

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

Justification Local concentration PEC soil (local+regional) 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 Justification **Local concentration** PEC air (local+regional) EUSES calculation During emission mg/m³ Not evaluated. 0 Annual average mg/m³ 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 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	
Fresh water mg/l	Local concentration 1.20x10-4	PEC aquatic (local+regional) 5.58x10-4	Justification 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

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.

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

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** 1.20x10-4 **EUSES** calculation Fresh water mg/l 5.58x10-4 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 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation 7.70x10-4 Groundwater mg/l Not evaluated. **EUSES** calculation Local concentration PEC air (local+regional) **Justification EUSES** calculation During emission mg/m³ 7.93x10-6 Not evaluated. Annual average mg/m³ 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.

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

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

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.

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

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

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

has been derived.

Short term exposure, Systemic,

Dermal

Not applicable

Not applicable.

Not applicable.

Not applicable.

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

has been derived.

Short term exposure, Systemic,

Inhalable

Not 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

Contributing scenarios Dose/Concentration Route of exposure **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

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

Not applicable.

has been derived 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, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DN

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

nas peen denve

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

has been derived.

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

acute effects and therefore, no acute DNEL

has been derived.

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

Inhalable

Combined

Short term exposure, Systemic,

estimate workplace 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)

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

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. 18600 Regional use tonnage (tonnes/year): 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

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

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.

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 domestic 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.

Indoor, industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

Not available.

Not available

Not available.

Not applicable.

=>37.4

Not available.

wastewater.

2000

Other given operational conditions affecting environmental

xposure:

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

Oilly).

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:

Assumed domestic 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

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

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:

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

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

n

Not available.

Not available.

Not available

Not applicable.

Not available.

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

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

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

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): Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 21500 Maximum daily site tonnage (kg/day): Not available

Frequency and duration of use: Continuous release.

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:

Indoor. industrial setting

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:

7 36x10-4

5 00x10-5

Not available.

Not available.

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%

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

Substance supplied to that use in form of: As such

Sector of end use: SU03

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

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

2000 Assumed domestic 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

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

Indoor, industrial setting

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not available

wastewater.

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 Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level Not applicable.

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

from source towards the worker:

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

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

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

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 exposure:

Technical conditions and measures at process level

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

from source towards the worker:

Indoor. industrial setting

Not applicable.

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

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

exposure:

Technical conditions and measures at process level

Not applicable.

(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:

removal efficiency of (%): 90%

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

Not applicable.

Personal protection:

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

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

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

Amounts used:

Product characteristics:

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:

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

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

removal efficiency of (%): 90%

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

Not applicable.

Personal protection:

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

minimum efficacy of 90%

Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

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

Product characteristics: Amounts used:

Not applicable

Frequency and duration of use:

from source towards the worker:

Avoid carrying out operation for more than 1 hour.

Human factors not influenced by risk management:

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

Other given operational conditions affecting workers exposure:

Indoor. industrial setting

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

Not applicable.

(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%

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

Not applicable.

Personal protection:

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

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:

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 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)

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 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 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%

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 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

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

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

Total release for regional

Section 3:.1 Environment - Exposure estimation

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

Release from point source

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	Local concentration 2.33x10-7	PEC aquatic (local+regional) 4.37x10-4	Justification EUSES calculation
Fresh water mg/l Marine water mg/l			
	2.33x10-7	4.37x10-4	EUSES calculation
Marine water mg/l	2.33x10-7 2.33x10-7	4.37x10-4 4.36x10-5	EUSES calculation
Marine water mg/l	2.33x10-7 2.33x10-7 Not applicable	4.37x10-4 4.36x10-5 Not applicable	EUSES calculation EUSES calculation Not applicable.
Marine water mg/l Intermittent release. mg/l	2.33x10-7 2.33x10-7 Not applicable Local concentration	4.37x10-4 4.36x10-5 Not applicable PEC sediment (local+regional)	EUSES calculation EUSES calculation Not applicable. Justification

Tetraethylenepentamine, TEPA

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

Justification

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

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/ day	exposure estimation kg/day	oustmoution
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	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 3: Manufacture of coatings, adhesives and inks (and powder products)

	(local exposure estimation) kg/	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

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	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.

Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.
Section 3:.2 Workers - Exposure & 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.
1.			

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

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, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, Not applicable. 0.12 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

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

Route of exposure Dose/Concentration Contributing scenarios 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 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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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** 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, 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)

Contributing scenarios Dose/Concentration Route of exposure **Justification** Long term exposure, Systemic, Not applicable. 0.14 The ECETOC TRA tool has been used to estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. 0.30 The ECETOC TRA tool has been used to 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 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. 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

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

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

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

below this value

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, Not applicable. 0.30 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Combined** Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Combined** acute effects and therefore, no acute DNEL has been derived Since the substance is not classified for Short term exposure, Local, Dermal Not applicable. Not applicable. acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 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 Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 4: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) Route of exposure **Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.27 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 0.30 Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Not applicable. Long term exposure, Systemic, Combined 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. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable

Combined

Not applicable.

Not applicable.

Not applicable.

Not applicable.

0.60

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.

The ECETOC TRA tool has been used to

estimate workplace 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

Short term exposure, Local, Dermal

Short term exposure, Local,

Inhalable

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:.2 Workers - Exposure esti	imation		
containers at non-dedicated facilities		er 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.	0.27	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 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.	0.74	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	mation		
		er 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 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 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.

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, 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 Contributing scenario controlling we including weighing)		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 Long term exposure, Local, Inhalable	Not applicable. Not applicable	Not applicable. Not applicable.	Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable.	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	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	•		
Route of exposure Systemic	Contributing scenarios	Dose/Concentration	Justification The ECETOC TRA tool has been used to
Long term exposure, Systemic, Dermal	Not applicable.	0.14	estimate workplace exposures unless otherwise indicated. 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			Use of ethylenamines in closed system with little - Use of preparations containing EA up to 100% - Industrial
			ROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15 stance 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 61/292 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. 0.62 The ECETOC TRA tool has been used to Inhalable exposures unless

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

below this value

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition 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:

Amounts used:

Fraction of EU tonnage used in region: 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.

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

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

(%):

Tetraethylenepentamine, TEPA

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.

Not available.

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

63/292

Industrial

Assumed domestic sewage treatment plant flow (m3/d): 2000

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

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

Local freshwater dilution factor: 1000

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

Indoor. industrial setting

1 00x10-4

4.84x10-8

Not available.

Not available.

Not available.

Not applicable.

=>37.4

Not available.

wastewater.

9300

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):

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

Assumed domestic 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): 25% Fraction of Regional tonnage used locally: 2320 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10300 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%

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

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

Prevent discharge of undissolved substance to or recover from onsite

Industrial

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

Sector of end use: SU03

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

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor:

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

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: $\geq 2.0 \times 10.6 \text{m}^3/\text{d}$

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

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

Not applicable.

Not available

4840

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%

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 65/292 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: Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

=>37.4

Conditions and measures related to municipal sewage treatment

2000 Assumed domestic sewage treatment plant flow (m³/d):

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

Liquid. Covers concentrations up to 2%

Amounts used:

Not applicable. Continuous release.

Frequency and duration of use: Human factors not influenced by risk management:

Product characteristics:

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

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

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

containers at non-dedicated facilities

Liquid. Covers concentrations up to 2%

Product characteristics: Amounts used:

Not applicable.

Frequency and duration of use:

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

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

from source towards the worker:

removal efficiency of (%): 90%

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

Not applicable.

Personal protection:

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

management supervision controls.

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:

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

Not applicable.

from source towards the worker: 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 2% -

Industrial

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

Sector of end use: SU03

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

Personal protection:

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

Section 2.2: Control of worker exposure

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

including weighing)

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

Frequency and duration of use:

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

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	
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.

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.

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	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	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

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

Total release for regional

. Industrial

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

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

	Local concentration	PEC 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 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 - Exposure estimation

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

(multistage and/or significant contact	ct)		
Route of exposure	Contributing scenarios	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% -

Industrial

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

Sector of end use: SU03

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

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

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

Route of exposure

Long term exposure, Systemic, **Dermal**

Not applicable.

Dose/Concentration 0.005

Justification

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

The ECETOC TRA tool has been used to

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

Contributing scenarios

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 Not applicable.

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal

Long term exposure, Local, Inhalable

Not evaluated. Not applicable

Not applicable

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.

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,

Short term exposure, Local,

Combined

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, Local, Dermal

Not applicable

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 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, **Dermal**

Not applicable.

0.005

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

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

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

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)

Contributing scenarios Route of exposure **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 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.

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. 1.22 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

Not applicable.

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 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 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: 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.

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

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:

Tetraethylenepentamine, TEPA

Technical on-site 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.

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 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 domestic sewage treatment plant flow (m3/d): 2000

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

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

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

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

Assumed domestic 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

9300

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): 25% Fraction of Regional tonnage used locally: 2320 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10300 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%

Industrial

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

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor:

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

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:

1000 River flow rate: >=2 0x10 6 m³/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): Fraction of Regional tonnage used locally: 25% 1210 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 21500 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

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:

4840

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 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 74/292 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: Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Not available.

=>37.4

Conditions and measures related to municipal sewage treatment

2000 Assumed domestic sewage treatment plant flow (m³/d):

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

Not applicable.

Indoor. industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

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

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: Indoor. industrial setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

Not applicable.

Not applicable.

dispersion and exposure:

Personal protection:

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 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. Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Human factors not influenced by risk management: Other given operational conditions affecting workers Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

exposure:

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.

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

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	
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/m ³	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 0.5% -

Industrial

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

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC06a

Section 3:.1 Environment - Exposure estimation

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

Release from point source

	(local exposure estimation) kg/	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

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	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	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

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

	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 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 - Exposure estimation

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

(multistage and/or significant contact	, c)		
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% -

Industrial

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

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

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

Not applicable.

Not applicable.

Not applicable. 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. Not applicable. Inhalable

Short term exposure, Systemic,

Not applicable. **Dermal**

Short term exposure, Systemic,

Inhalable Short term exposure, Systemic,

Combined Short term exposure, Local, Dermal

Short term exposure, Local,

Inhalable

Not applicable. 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.

Not applicable.

Not applicable.

Not applicable.

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 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:

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.

Indoor. industrial setting

1.00x10-4

4.84x10-8

Not available.

Not available.

Not available.

Not applicable.

=>37.4

Not available.

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

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

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 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: 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

81/292

Professional

Tetraethylenepentamine, TEPA

Assumed domestic sewage treatment plant flow (m3/d): 2000

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

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

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

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

Assumed domestic 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: 2320 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10300 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

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor:

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

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

Treat air emission to provide a typical removal efficiency of

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% 1210 Annual site tonnage (tonnes/year): 21500 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 River flow rate: >=2.0x10 6m3/d Local freshwater dilution factor:

Local marine water dilution factor:

Indoor, industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

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

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:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

=>37.4

Not available.

Conditions and measures related to municipal sewage treatment

2000 Assumed domestic sewage treatment plant flow (m³/d):

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

Total release for regional **Justification** Release from point source (local exposure estimation) kg/ exposure estimation kg/day 7.50x10-4 Waste water 192 **EUSES** calculation Not evaluated. **Surface water** 4.8 **EUSES** calculation air (direct + STP) 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. **EUSES** calculation 0 Value **Justification**

Concentration in sewage (PECstp) 2.35x10-4 **FUSES** calculation

mg/l

0.355 **EUSES** calculation Concentration in sewage sludge

mg/kg dwt

Local concentration PEC aquatic (local+regional) Justification

2.33x10-7 4.37x10-4 **EUSES** calculation Fresh water mg/l 4.36x10-5 Marine water mg/l 2 33x10-7 **EUSES** calculation Intermittent release. mg/l Not applicable Not applicable Not applicable. Justification Local concentration PEC sediment (local+regional) Not evaluated. 0.221 **EUSES** calculation Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation Local concentration PEC soil (local+regional) **Justification** 1.21x10-3 0.077 **EUSES** calculation

Agricultural soil averaged mg/kg

dwt

Grassland averaged mg/kg dwt

Groundwater mg/l

2 39x10-3 Not evaluated. **Local concentration** 0.077 7.69x10-4 PEC air (local+regional) **FUSES** calculation

EUSES calculation **Justification**

During emission mg/m³ 5.86x10-15

Not evaluated.

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

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 1: Use 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.

Section 3:.1 Environment - Exposure estimation

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

	Release from point source (local exposure estimation) kg/ day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	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
ntermittent release. mg/l	Not applicable	Not applicable	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	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 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

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.

Release from point source

Section 3:.1 Environment - Exposure estimation

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

Total release for regional

	(local exposure estimation) kg/	exposure estimation kg/day	oustmoution
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,	Not applicable.	0.005	The ECETOC TRA tool ha

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

Justification

Long term exposure, Systemic, Not applicable. 0.31 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.

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

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

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

EnvironmentNot available.HealthNot available.

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

EnvironmentNot applicable.HealthNot applicable.Additional Good PracticesNot applicable.



Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition 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. 18600 Regional use tonnage (tonnes/year): 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:

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 7.36x10-4

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:

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

Conditions and measures related to municipal sewage treatment

=>37.4

Not available.

Indoor. industrial setting

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

Assumed domestic sewage treatment plant flow (m3/d): 2000

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor use.

Product characteristics: Not applicable.

Amounts used:

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

Environment factors not influenced by risk management:

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

Indoor. industrial setting

1 00x10-4

4.84x10-8

Not available.

Not available.

Not available.

Not applicable.

=>37.4

Not available.

wastewater.

2000

9300

Local marine water dilution factor: Not applicable.

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):

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

Assumed domestic 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): 25% Fraction of Regional tonnage used locally: 2320 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 10300 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%

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

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

Prevent discharge of undissolved substance to or recover from onsite

Professional

Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

Environment factors not influenced by risk management:

Local freshwater dilution factor:

Local marine water dilution factor:

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

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% 1210 Annual site tonnage (tonnes/year): 21500 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 River flow rate: >=2.0x10 6m3/d Local freshwater dilution factor:

Local marine water dilution factor:

Indoor, industrial setting Other given operational conditions affecting environmental

exposure:

Release fraction to air from process (initial release prior to

RMM):

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

Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

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 0.5% -

Professional Process Category: PROC08a

Substance supplied to that use in form of: As such

Sector of end use: SU22

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

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

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

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

2000 Assumed domestic sewage treatment plant flow (m³/d):

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.

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

Justification

management supervision controls.

Total release for regional

exposure estimation kg/day

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Manufacture of substances

Release from point source

(local exposure estimation) kg/

	day		
Waste water	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

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.

Section 3:.1 Environment - Exposure estimation

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

	Release from point source (local exposure estimation) kg/day	Total release for regional exposure estimation kg/day	Justification
Waste water	0	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	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.022	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Tetraethylenenentamine TEPA		Identified use name: Use of	f ethylenamines in close

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

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.

Release from point source

Section 3:.1 Environment - Exposure estimation

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

Total release for regional

	(local exposure estimation) kg/	exposure estimation kg/day	
Waste water	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
			lateria and recommendation of the action of the section

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

below this value

Justification

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.

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% -

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

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

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 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
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 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: 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

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 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

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): 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:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

only):

Release fraction to soil from wide dispersive use (regional

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

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

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

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

If discharging to domestic sewage treatment plant, provide

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

Conditions and measures related to municipal sewage treatment

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% Annual site tonnage (tonnes/year): 465 2114 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):

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

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

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: Not applicable.

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.

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

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:

Tetraethylenepentamine, TEPA

5.00x10-4

1 00x10-2

5 00x10-3

Not available.

Not available.

Not available.

Not applicable.

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

> preparations containing EA up to 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:

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

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):

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 available.

Not available

None.

7.36x10-4

1.00x10-3

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.

=>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:

Not available. 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): 232 773 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 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):

0.01 Release fraction to wastewater from process (initial release

prior to RMM):

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

Release fraction to soil from wide dispersive use (regional

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.

Not available.

=>37 4

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 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. 4840

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: 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

Tetraethylenepentamine, TEPA

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 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

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 ³ (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

None.

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%.

=>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:

Amounts used:

Fraction of EU tonnage used in region: 5580 Regional use tonnage (tonnes/year): 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:

220 Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

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 applicable.

Not available.

Continuous release.

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.

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) 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 (%):

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 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): 25% Fraction of Regional tonnage used locally: 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):

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:

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

Technical on-site conditions and measures to reduce or limit

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not applicable.

1860

220

None.

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 101/292 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

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:

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.

Do not use for more than 1 hours

Indoor, industrial setting

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 percentage substance in the product up to 25%. 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 removal efficiency of (%): 90%

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

Not applicable.

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

management supervision controls.

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

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.

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

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

Indoor. industrial setting

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

Justification

management supervision controls.

Total release for regional

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Release from point source

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

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,

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
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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.

Total release for regional

Section 3:.1 Environment - Exposure estimation

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

Release from point source

	(local exposure estimation) kg/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]
	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

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

Justification

Sector of end use: SU03

Subsequent service life relevant for that use: No. Release Category: FRC01_FRC02_FRC04_FRC05.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Not evaluated. **EUSES** calculation Groundwater mg/l 7.69x10-4 **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 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/m ³	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.

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 Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 0.239 0.051	Justification EUSES calculation 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
Micro-organism mg/l	Local concentration Not applicable.	PEC aquatic (local+regional) Not applicable.	Justification 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/m ³	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 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

Concentration in sewage (PECstp) 1.23x10-3 **EUSES** calculation Concentration in sewage sludge 1.86 **EUSES** calculation mg/kg dwt **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 1.22x10-6 **EUSES** calculation 4.38x10-4 Marine water mg/l 4.46x10-5 1.22x10-6 **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 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 PEC air (local+regional) **Local concentration Justification** During emission mg/m³ **EUSES** calculation 8.06x10-7 Not evaluated. Annual average mg/m³ 4.86x10-7 4.86x10-7 **EUSES** calculation Annual deposition mg/m²/d 1.03x10-6 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 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

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	Environment -	Exposure	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 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 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 The ECETOC TRA tool has been used to 0.73115 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 **Contributing scenarios Dose/Concentration** Justification Route of exposure 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 Long term exposure, Systemic, The ECETOC TRA tool has been used to 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 applicable. Not evaluated. Not applicable. Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 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 2: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Route of exposure **Dermal**

Contributing scenarios

Dose/Concentration

Justification

Long term exposure, Systemic,

Not applicable.

0.034286

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

0.548325

The ECETOC TRA tool has been used to estimate workplace 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% - 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, Inhalable	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

including weighing) 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, 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.	0.73115	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

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

below this value

Substance supplied to that use in form of: In a mixture Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, 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 25% - Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09 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

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
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

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): 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:

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.

4840

1000

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 112/292 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 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 5273 Average Local Daily Tonnage (kg/day):

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

exposure:

RMM):

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 (%):

plant:

Not applicable.

4650

Continuous release.

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.

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

Maximum daily site tonnage (kg/day):

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. Fraction of EU tonnage used in region: 1860 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 465 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 2114

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

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

only):

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

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

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

Treat air emission to provide a typical removal efficiency of

(%):

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

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

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

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 5.00.10-4

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

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

5.00.10-3

1.00.10-2

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 ³ (%):

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

plant:

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 5500 Average Local Daily Tonnage (kg/day): Maximum daily site tonnage (kg/day): Not available.

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

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

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

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

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available

Continuous release.

220

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.

Not applicable. Product characteristics:

Amounts used:

Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 930 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 232 773 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: 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:

Treat air 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.

Continuous release

1000

7.36.10-4

1.00.10-3

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: 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

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

Local marine water dilution factor: 1000 Other given operational conditions affecting environmental None exposure: Release fraction to air from process (initial release prior to 7.36.10-4 RMM): Release fraction to soil from process (initial release prior to 1.00.10-3 RMM): Release fraction to wastewater from process (initial release 1.00.10-3 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

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

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% 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: 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):

prevent release:

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

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

Not available.

Not available.

220

None.

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 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)

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

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:

Not available. 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 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:

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

exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

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

plant:

Technical on-site 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.

1000

None.

7 36F-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,

118/292

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

Not applicable.

Indoor, industrial setting

(multistage and/or significant contact)

Product characteristics: Liquid. Covers concentrations up to 15%

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

Technical conditions and measures at process level

(source) to prevent release:

Personal protection:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

removal efficiency of (%): 90% Not applicable.

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

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%

Not applicable. **Amounts used:**

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

Human factors not influenced by risk management: 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:

Other given operational conditions affecting workers

exposure:

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

Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

Amounts used:

Frequency and duration of use:

Human factors not influenced by risk management:

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 15%

Not applicable.

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.

Section 2.2: Control of worker exposure

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

containers at dedicated facilities

Product characteristics:

_

Frequency and duration of use:

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

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:

Liquid. Covers concentrations up to 15%

Not applicable.

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

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

Indoor. industrial setting

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls.

Section 2.2: Control of worker exposure

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

Indoor, industrial setting

including weighing)

Product characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

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

exposure:

Technical conditions and measures at process level

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

(source) to prevent release:

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.

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 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:

Not applicable.

Not applicable.

Frequency and duration of use:

Exposure duration per day: 1-4 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:

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

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 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).

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

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

Technical conditions and measures to control dispersion

(source) to prevent release:

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.

Total release for regional

Not applicable.

0.221

PEC sediment (local+regional)

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Not applicable.

Not evaluated.

Local concentration

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]
	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

Fresh water sediment mg/kg dwt

Intermittent release. mg/l

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

Not applicable.

Justification EUSES calculation

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)	Not applicable as there is no	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

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

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Justification Local concentration** PEC aquatic (local+regional) 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 Justification** PEC sediment (local+regional) 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 dwt Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Not evaluated. Groundwater mg/l 7.69x10-4 **EUSES** calculation PEC air (local+regional) **Local concentration Justification** During emission mg/m³ 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 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 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, 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/day	exposure estimation kg/day	
0.388	19.2	EUSES calculation
Not evaluated.	4.8	EUSES calculation
0.0285	30.3	EUSES calculation
Not evaluated.	0	Table R16.23 [REACH]
Value	Justification	
0.121	EUSES calculation	
183	EUSES calculation	
Local concentration	PEC aquatic (local+regional)	Justification
1.20x10-4	5.58x10-4	EUSES calculation
1.92x10-4	2.36x10-4	EUSES calculation
Not applicable.	Not applicable.	Not applicable.
Local concentration	PEC sediment (local+regional)	Justification
Not evaluated.	0.282	EUSES calculation
Not evaluated.	0.119	EUSES calculation
Local concentration	PEC soil (local+regional)	Justification
1.64x10-4	0.077	EUSES calculation
	day 0.388 Not evaluated. 0.0285 Not evaluated. Value 0.121 183 Local concentration 1.20x10-4 1.92x10-4 Not applicable. Local concentration Not evaluated. Not evaluated. Local concentration	day 0.388 19.2 Not evaluated. 4.8 0.0285 30.3 Not evaluated. 0 Value Justification 0.121 EUSES calculation 183 EUSES calculation Local concentration PEC aquatic (local+regional) 1.20x10-4 5.58x10-4 1.92x10-4 Not applicable. Not applicable. Not applicable. Local concentration PEC sediment (local+regional) Not evaluated. 0.282 Not evaluated. 0.119 Local concentration PEC soil (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 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. IR Release Category: FRC01 FRC02 FRC04 FRC05

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC011a, ERC12a, ERC12b

0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 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 6.52x10-6 **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

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

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	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	4.37x10-4	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

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

	orker exposure for 0: Mixing	or blending in batch processes	for formulation of preparations* and articles
(multistage and/or significant contact Route of exposure	•	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Contributing scenarios 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
Section 3:.2 Workers - Exposure esti Contributing scenario controlling wo		ering operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not 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			Use of ethylenamines in open processes with high

Identified use name: 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

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 2: Industrial spraying **Route of exposure Contributing scenarios** Justification **Dose/Concentration** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.1286 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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 Since the substance is not classified for Long term exposure, Local, Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, 0.914 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, The ECETOC TRA tool has been used to 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 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

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
containers at dedicated facilities	orker exposure for 4: Transfe		charging/discharging) from/to vessels/large
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. 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

0.914

Tetraethylenepentamine, TEPA

Short term exposure, Local,

Inhalable

Not applicable.

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

has been derived.

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

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 3:.2 Workers - Exposure est			
Contributing scenario controlling wo including weighing)	orker exposure for 5: Transfe	r of substance or preparation in	to small containers (dedicated filling line,
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.0822	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.457	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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
Section 3:.2 Workers - Exposure est		out of outletes by displant and us	to
Contributing scenario controlling w	•		
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

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

Not applicable

Inhalable

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

has been derived.

has been derived.

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

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

acute effects and therefore, no acute DNEL

acute effects and therefore, no acute DNEL

Since the substance is not classified for

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

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

has been derived.

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

has been derived

Short term exposure, Local,

Inhalable

Not applicable.

1.097

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

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.

Dose/Concentration 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

Long term exposure, Local, Dermal

Long term exposure, Local, Inhalable

Not applicable. Not applicable

Not evaluated.

Not applicable.

Not applicable.

Not applicable. Not applicable.

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

has been derived.

Short term exposure, Systemic, **Dermal**

Not applicable

Not applicable.

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

has been derived.

Short term exposure, Systemic, Inhalable

Not applicable Not applicable.

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

has been derived. Since the substance is not classified for

Short term exposure, Systemic, Combined

Short term exposure, Local,

Inhalable

Not applicable

Not applicable.

Not applicable.

acute effects and therefore, no acute DNEL

has been derived.

Short term exposure, Local, Dermal Not applicable

Not applicable.

0.914

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

has been derived.

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

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

below this value

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

Environment Not available Health Not available

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

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

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 o	f environmenta	l exposure
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (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):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

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

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 (%):

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.

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

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:

Amounts used:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 1160 Annual site tonnage (tonnes/year): 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):

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

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

4650

220

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

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% 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): 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 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

Technical on-site 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:

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

Release fraction to air from process (initial release prior to

RMM):

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

prior to RMM):

Release fraction to wastewater from process (initial release 5.00.10-3

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

Not available.

5.00.10-4

1.00.10-2

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%.

=>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:

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.

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 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.

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 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:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 930 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 232 773 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

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.

1000

7.36.10-4

1.00.10-3

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: 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

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 None Other given operational conditions affecting environmental exposure: 7.36.10-4 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

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:

Not available. Fraction of EU tonnage used in region: 5580 Regional use tonnage (tonnes/year): 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): 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

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:

7.36.10-4

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 (%):

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

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 only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

Not available.

None.

7 36F-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).

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.

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:

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:

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

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Indoor, professional setting

Not applicable.

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).

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

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,

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:

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 5: Roller application or brushing

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

Technical conditions and measures to control dispersion

from source towards the worker:

(source) to prevent release:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Indoor, industrial setting

Indoor, professional setting

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

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:

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:

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

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 7: Treatment of articles by dipping and pouring

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers

exposure:

Indoor. industrial setting Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 8: Production of preparations* or articles by tabletting, compression, extrusion,

pelletisation

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers

exposure:

Default breatning volume Light work: 10 m/d Default Body w

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.

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 141/292

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

exposure:

Indoor. professional setting

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

Not applicable.

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:

Not applicable.

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 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 -	Exposure	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/	Total release for regional exposure estimation kg/day	Justification
	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]
	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,

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

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 Annual average mg/m³ 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.

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

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,

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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/	exposure estimation kg/day	
Waste water	day 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.

Total release for regional

Justification

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 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	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, ERC08f, ERC11a, ERC12a, ERC12b

1.53x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l **EUSES** calculation Not evaluated. 7.70x10-4 **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 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 8: Use of coatings and adhesives

	Release from point source (local exposure estimation) kg/	Total release for regional exposure estimation kg/day	Justification
Waste water	day 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.	0.05	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,

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 Contributing scenario controlling we		ial spraying	
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

Identified use name: 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.

below this value

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 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
		r of substance or preparation (c	harging/discharging) from/to vessels/large
containers at dedicated facilities Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.05	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,	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
Inhalable Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal	Not applicable. Not evaluated.	Not applicable. Not applicable.	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			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
Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local,	Not evaluated.	Not applicable.	otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNE

Section 3:.2 Workers - Exposure estimation

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

Process Category: PROC05, 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 The ECETOC TRA tool has been used to 1 22 Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 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. Not applicable. Long term exposure, Systemic, 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 Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for 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 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 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

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 expolable Section 3:.2 Wor Contributing sec Route of exposu Long term expos Dermal Long term expos Inhalable Long term expos Combined	esure, Local, Dermal esure, Local, rkers - Exposure estimation controlling would be sure, Systemic, sure, Systemic, sure, Systemic, sure, Systemic,	Not applicable.	Not applicable. Not applicable. Not applicable. nent of articles by dipping and po Dose/Concentration 0.09 0.61 Not applicable. Not applicable. Not applicable.	Not applicable. Not applicable. During Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Not applicable.
Short term expo Inhalable Section 3:.2 Wor Contributing see Route of exposu Long term exposi Dermal Long term exposi Inhalable Long term exposi Combined Long term exposi	esure, Local, Dermal esure, Local, rkers - Exposure estimation controlling would be sure, Systemic, sure, Systemic, sure, Systemic, sure, Systemic,	Not applicable. Not applicable. Imation Orker exposure for 7: Treatn Contributing scenarios Not applicable. Not applicable. Not applicable. Not applicable.	Not applicable. Not applicable. ment of articles by dipping and po Dose/Concentration 0.09 0.61 Not applicable. Not applicable.	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace 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.
Short term expolentable Section 3:.2 Wor Contributing section 3:.2 Wor Contributing section and the section at	esure, Local, Dermal esure, Local, rkers - Exposure estimation controlling woure sure, Systemic, sure, Systemic,	Not applicable. Not applicable. imation orker exposure for 7: Treatn Contributing scenarios Not applicable. Not applicable.	Not applicable. Not applicable. ment of articles by dipping and po Dose/Concentration 0.09 0.61	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Short term expo Inhalable Section 3:.2 Wor Contributing sec Route of exposu Long term exposi Dermal Long term exposi Inhalable	esure, Local, Dermal esure, Local, rkers - Exposure estimation controlling woure sure, Systemic, sure, Systemic,	Not applicable. Not applicable. imation orker exposure for 7: Treatn Contributing scenarios Not applicable. Not applicable.	Not applicable. Not applicable. ment of articles by dipping and po Dose/Concentration 0.09 0.61	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Short term expo Inhalable Section 3:.2 Wor Contributing sec Route of exposu Long term exposi Dermal	esure, Local, Dermal esure, Local, rkers - Exposure esti enario controlling wo ure sure, Systemic,	Not applicable. Not applicable. imation orker exposure for 7: Treatn Contributing scenarios Not applicable.	Not applicable. Not applicable. nent of articles by dipping and po Dose/Concentration 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 The ECETOC TRA tool has been used to
Short term expo Inhalable Section 3:.2 Wor Contributing sce Route of exposu Long term expos	osure, Local, Dermal osure, Local, rkers - Exposure estienario controlling wo	Not applicable. Not applicable. imation orker exposure for 7: Treatn Contributing scenarios	Not applicable. Not applicable. nent of articles by dipping and po	Not applicable. During Justification The ECETOC TRA tool has been used to estimate workplace exposures unless
Short term expo Inhalable Section 3:.2 Wor Contributing sce	osure, Local, Dermal osure, Local, rkers - Exposure esti enario controlling wo	Not applicable. Not applicable. imation orker exposure for 7: Treatn	Not applicable. Not applicable. nent of articles by dipping and po	Not applicable.
Short term expo Inhalable Section 3:.2 Wor	osure, Local, Dermal osure, Local, rkers - Exposure esti	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable.
Short term expo	sure, Local, Dermal	Not applicable.	Not applicable.	• •
What town		••		Not appliable
Short term expo Combined		* · · · · · · · · · · · · · · · · · · ·	Not applicable.	Not applicable.
Short term expo Inhalable	sure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Short term expo Dermal	sure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Long term expos		Not applicable.	Not applicable.	Not applicable.
Combined Long term expos	sure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Inhalable Long term expos	sure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Dermal Long term expos	sure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Long term expos		Not applicable.	Not applicable.	Not applicable.
Contributing sce Route of exposu	_	orker exposure for 6: Non in Contributing scenarios	Dose/Concentration	Justification
	rkers - Exposure est		advetrial opraving	
Short term expo Inhalable	ssure, LOCAI,	Not applicable.	1.22	estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
·	osure, Local, Dermal		Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived. The ECETOC TRA tool has been used to
Short term expo Combined	osure, Systemic,	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term expo Inhalable	sure, Systemic,	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived.
Short term expo Dermal	sure, Systemic,	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived.
Long term expos Inhalable	sure, Local,	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNI has been derived.
	sure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.
Long term expos	sure, Systemic,	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 **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 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 **Contributing scenarios Dose/Concentration Justification** Route of exposure Long term exposure, Systemic, Not applicable. The ECETOC TRA tool has been used to 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 0.61 The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic, Combined Long term exposure, Local, Dermal

Not applicable. Not applicable.

Not applicable.

Not applicable. Not applicable.

Not applicable.

Not applicable. Not applicable.

Inhalable Short term exposure, Systemic, **Dermal**

Long term exposure, Local,

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.

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 estimation

Contributing scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available

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

Long term exposure, Systemic, Inhalable

Inhalable

Inhalable

Not applicable.

0.61

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

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

below this value

Long term exposure, Systemic, Combined

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

Not applicable. Not applicable.

Not applicable.

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 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, **Dermal**

Inhalable

Short term exposure, Systemic,

Short term exposure, Systemic,

Combined

Short term exposure, Local, Dermal

Short term exposure, Local, Inhalable

Not applicable.

Not applicable.

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 4:: Guidance to check compliance with the exposure scenario

Not available. **Environment** 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.

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



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 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:

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):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental

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

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 (%):

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.

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% - 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: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

4650 Regional use tonnage (tonnes/year): Fraction of Regional tonnage used locally: 25% 1160 Annual site tonnage (tonnes/year): 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):

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

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.

220

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.

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% 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

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 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

Technical on-site 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 7.36.10-4

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:

plant:

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.

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):

300

5.00.10-4

1.00.10-2

5.00.10-3

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%.

=>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:

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:

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

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.

4840

Not available.

220

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:

Not available. Fraction of EU tonnage used in region:

Regional use tonnage (tonnes/year): 930 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 232 773 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

Release fraction to air from process (initial release prior to

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):

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:

7.36.10-4

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: 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

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

Local marine water dilution factor: 1000 None Other given operational conditions affecting environmental exposure: 7.36.10-4 Release fraction to air from process (initial release prior to RMM): 1.00.10-3

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

Release fraction to wastewater from process (initial release 1.00.10-3 prior to RMM):

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

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

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:

Not available

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 (%):

If discharging to domestic sewage treatment plant, provide Not available. the required onsite wastewater removal efficiency of ³ (%):

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.

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: 5580 Regional use tonnage (tonnes/year): 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): 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 7.36.10-4

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

Release fraction to wastewater from process (initial release

prior to RMM):

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

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

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:

Tetraethylenepentamine, TEPA

prevent release:

Identified use name: 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.

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 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):

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):

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.

220

1000

7 36F-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 160/292

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).

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

exposure: Indoor, industrial setting and professional setting

Indoor, professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Industrial spraying

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

Human factors not influenced by risk management: Default breathing volume Light work: 10 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:

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

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

management supervision controls.

Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

Indoor, industrial setting and professional 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:

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 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

Indoor. industrial setting Other given operational conditions affecting workers

Indoor, industrial setting and professional setting exposure:

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line,

including weighing)

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

Indoor. industrial setting and professional setting exposure:

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

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

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

management supervision controls.

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).

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

Not applicable.

Other given operational conditions affecting workers

exposure:

Indoor, industrial setting Indoor, industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

Not applicable.

dispersion and exposure:

Personal protection:

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

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

management supervision controls.

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

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:

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

removal efficiency of (%): 90%

Indoor. professional setting

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: Treatment of articles by dipping and pouring

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. industrial setting and professional setting exposure:

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Not applicable.

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

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

management supervision controls.

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

exposure:

Indoor, industrial setting

Indoor. industrial setting and professional setting Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable. Not applicable.

Not applicable.

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

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

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

Not applicable.

Not applicable.

Not applicable.

Other given operational conditions affecting workers Indoor, industrial setting

Indoor. industrial setting and professional setting exposure:

Release from point source

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:

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

Justification

management supervision controls.

Total release for regional

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

	(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	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 164/292

Section 3:.1	Environment -	 Exposure 	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 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

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 Annual average mg/m³ 3.94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. Not evaluated. **EUSES** calculation **Justification Local concentration** PEC aquatic (local+regional) 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.	7.69x10⁴	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

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 166/292

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
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.

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,

ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c,

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,

ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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

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

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. al Release Category: FRC01, FRC02, FRC04, FRC05.

Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

1.53x10⁻⁴ 0.077 **EUSES** calculation Grassland averaged mg/kg dwt Groundwater mg/l **EUSES** calculation Not evaluated. 7.70x10⁻⁴ **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 5.11x10⁻⁶ **EUSES** calculation Not evaluated. Annual average mg/m³ 3.08x10⁻⁶ **EUSES** calculation 3.08x10⁻⁶ Annual deposition mg/m²/d 6.52x10⁻⁶ 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 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 con	tact)		
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,	Not applicable.	Not applicable.	Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

Long term exposure, Local, Dermal Not applicable.

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

Not applicable.

ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.52 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 1: Industrial spraying Route of exposure **Contributing scenarios Dose/Concentration** Justification Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.11 **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 Long term exposure, Systemic, Not applicable. 0.30 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 Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable Not applicable. Not applicable. Short term exposure, Systemic, 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 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. 0.14 **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 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, 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 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	imation		
		of substance or preparation (c	harging/discharging) from/to vessels/large
Contributing scenario controlling we		of substance or preparation (c Dose/Concentration	harging/discharging) from/to vessels/large Justification
Contributing scenario controlling wo containers at dedicated facilities Route of exposure Long term exposure, Systemic,	orker exposure for 3: Transfer		
Contributing scenario controlling we containers at dedicated facilities Route of exposure Long term exposure, Systemic, Dermal	orker exposure for 3: Transfer Contributing scenarios	Dose/Concentration	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
Contributing scenario controlling we containers at dedicated facilities Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic,	Contributing scenarios Not applicable.	Dose/Concentration 0.14	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
Contributing scenario controlling we containers at dedicated facilities Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic, Inhalable Long term exposure, Systemic, Combined	Contributing scenarios Not applicable. Not applicable.	Dose/Concentration 0.14 0.76	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Contributing scenario controlling we containers at dedicated facilities Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic, Inhalable Long term exposure, Systemic,	Contributing scenarios Not applicable. Not applicable.	Dose/Concentration 0.14 0.76 Not applicable.	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace 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.
Contributing scenario controlling we containers at dedicated facilities Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic, Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local,	Contributing scenarios Not applicable. Not applicable. Not applicable. Not applicable.	Dose/Concentration 0.14 0.76 Not applicable. Not applicable.	Justification The ECETOC TRA tool has been use estimate workplace 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 use estimate workplace 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	2.	2	Workers	_	Evnocura	estimation

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Local,

Not applicable.

Not applicable.

Not applicable.

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line,

Not applicable.

Not applicable.

Not applicable.

1.52

inc	ludi	ng	wei	ghii	ng)

Dermal

Inhalable

Combined

Inhalable

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,

Not applicable.

Not applicable.

Not applicable.

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

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 wo		pplication or brushing	
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 Contributing scenario controlling we		ustrial enraving	
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 Long term exposure, Local,	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Inhalable	Alak amaka abila	Not on allocable	

Not applicable.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

Short term exposure, Systemic,

Dermal

Inhalable

Not applicable.

Not applicable.

Not applicable.

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

Not applicable.

Not applicable.

Not applicable.

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, 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 Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, Not applicable. The ECETOC TRA tool has been used to 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 Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable. 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. Not applicable. Not applicable. Short term exposure, Systemic, **Combined** Short term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Short term exposure, Local, Not applicable. 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 8: Production of preparations* or articles by tabletting, compression, extrusion, pelletisation

Contributing scenarios Dose/Concentration Route of exposure Justification Long term exposure, Systemic, Not applicable. 0 14 The ECETOC TRA tool has been used to estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, 0.76 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 Not applicable. 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. 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.

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 173/292 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

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

Long term exposure, Systemic,

Dermal

Not applicable.

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

0.76

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

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

below this value Not applicable.

Not applicable.

Long term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Local,

Combined

Dermal

Inhalable

Inhalable

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

Inhalable

Not evaluated.

Not applicable

Not applicable

Not applicable

Not applicable.

Not applicable

Not applicable. Not applicable.

Not applicable.

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

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

has been derived. 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

Combined

Short term exposure, Local, Dermal Not applicable

Not applicable.

Not applicable.

1.52

has been derived. 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

acute effects and therefore, no acute DNEL

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

<u>174/29</u>2



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 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 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:

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

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 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

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 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 ³ (%):

Organisational measures to prevent/limit release from site:

Not available

220

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.

Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 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.

Continuous release. Frequency and duration of use:

Emission Days (days/year):

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

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

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: Not applicable.

Amounts used:

Fraction of EU tonnage used in region:

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): 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

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:

Not available

Not available.

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 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:

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

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:

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:

prevent release:

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

Treat air 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

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:

Not available. 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): 232 773 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 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):

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: 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

Not available.

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

Not available.

0.01

discharges, air 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 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

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

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 ³ (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

None.

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%.

=>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:

Not available. Fraction of EU tonnage used in region: 5580 Regional use tonnage (tonnes/year): 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.

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

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:

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) 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 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 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. Frequency and duration of use: Continuous release.

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

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

Not applicable.

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.

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:

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:

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Release from point source

(local exposure estimation) kg/ day

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

Waste water Surface water air (direct + STP)

Soil (direct releases only)

n Not evaluated.

48 Not evaluated. 0

192 **EUSES** calculation **EUSES** calculation 30.3 **EUSES** calculation Table R16.23 [REACH]

Concentration in sewage (PECstp) mg/l

Not applicable as there is no release to wastewater.

Justification 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 O 4.34x10-5 **EUSES** calculation Marine water mg/l Intermittent release. mg/l Not applicable. Not applicable. Not applicable. PEC sediment (local+regional) **Local concentration 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% - 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	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.

Release from point source Total release for regional

Section 3:.1 Environment - Exposure estimation

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

	(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]
	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)	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 25% - Professional

Justification

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. **Justification Local concentration** PEC aquatic (local+regional) 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 Justification** PEC sediment (local+regional) 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 dwt Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Not evaluated. Groundwater mg/l 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 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 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 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

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

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

Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.64x10-4	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	1.92x10-4	2.36x10-4	EUSES calculation
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in course (RECotn)	Value	Justification FUSES coloulation	
John (unlect releases offiny)			Table IN 10.23 [NEACH]
Soil (direct + 31P)	Not evaluated.	0	Table R16.23 [REACH]
Surface water air (direct + STP)	0.0285	30.3	EUSES calculation EUSES calculation
Waste water	0.388 Not evaluated.	19.2 4.8	EUSES calculation
	(local exposure estimation) kg/		

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
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	7.93x10-6	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.

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.

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

Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Local concentration Not evaluated. Not evaluated.	PEC sediment (local+regional) 0.221 0.022	Justification EUSES calculation 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.

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 Contribu

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

Subsequent service life relevant for that use: No.

Sector of end use: SU22

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.	0.365575	The ECETOC TRA tool has been used to
innalable			estimate workplace exposures unless otherwise indicated. 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
Section 3:.2 Workers - Exposure est Contributing scenario controlling we containers at non-dedicated facilities	orker exposure for 1: 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.	0.0685714	The ECETOC TRA tool has been used to estimate workplace exposures unless

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.	0.45697	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	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,	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

0.91393

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

Tetraethylenepentamine, TEPA

Short term exposure, Local,

Inhalable

Not applicable.

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 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

EnvironmentNot available.HealthNot 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

041	0.4			environmental exposure	
Section	2.1	: Control	OT	environmentai 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:

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

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 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:

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: 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):

only):

Release fraction to soil from wide dispersive use (regional

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

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available

4650

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.

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. Continuous release. Frequency and duration of use:

Emission Days (days/year):

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

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

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: Not applicable.

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.

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

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:

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:

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

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:

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

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:

4840

Not available

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

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 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. 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): 232 773 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 None.

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

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

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

Release fraction to air from wide dispersive use (regional

Release fraction to soil from wide dispersive use (regional

only):

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

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: 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 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 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

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 ³ (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

1.00x10-3

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.

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% 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:

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

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.

Continuous release.

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%.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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: Not available.

Regional use tonnage (tonnes/year): 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. Frequency and duration of use: Continuous release.

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

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

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

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 applicable.

1860

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 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:

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: Other given operational conditions affecting workers Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls.

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 m³/d Default Body weight: Workers: 70 kg Indoor. professional setting

Other given operational conditions affecting workers exposure:

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

Technical conditions and measures to control dispersion

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

Not applicable.

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 2: Non industrial spraying

Product characteristics: Liquid. Covers concentrations up to 10%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 15 min to <1 hour(s)

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

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

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

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

Justification Local concentration PEC soil (local+regional) 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** EUSES calculation During emission mg/m³ Not evaluated. 0 Annual average mg/m³ 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
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.

	(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

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

1	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.

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.

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

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.

Total release for regional

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 6: Lube oil use

Release from point source

Translation averaged mg/kg dwt	2.72/10-0	0.011	
dwt Grassland averaged mg/kg dwt	2.42x10-5	0.077	EUSES calculation
Agricultural soil averaged mg/kg	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
Concentration in sewage sludge mg/kg dwt	1.86	EUSES calculation	
Concentration in sewage (PECstp) mg/l	1.23x10-3	EUSES calculation	
(DE0-12)	Value	Justification 5.1050 a classifier	
Soli (direct releases only)			Table N 10.23 [NEACH]
air (direct + STP) Soil (direct releases only)	Not evaluated.	0	Table R16.23 [REACH]
Surface water	Not evaluated. 2.9x10-3	4.8 30.3	EUSES calculation EUSES calculation
Waste water	3.94x10-3	19.2	EUSES calculation
	day		
	(local exposure estimation) kg/	exposure estimation kg/day	Justinication

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 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

Groundwater mg/l Not evaluated. **EUSES** calculation 7.69x10-4 **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation 8.06x10-7 Annual average mg/m³ 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.

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

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

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

Section	3. 2	Workers	- Exposure	estimation
Section	JZ	VVUINCIS	- EXDUSUIE	esumation

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 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 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 Not applicable. Not applicable.

Long term exposure, Systemic,

Not evaluated. Combined

Long term exposure, Local, Dermal

Short term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Systemic,

Long term exposure, Local,

Inhalable

Dermal

Inhalable

Combined

Not applicable

Not applicable.

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable Not applicable.

Not applicable

Not applicable.

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

Short term exposure, Local, Inhalable

Not applicable.

0.914

0.0822

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

Since the substance is not classified for

acute effects and therefore, no acute DNEL

estimate workplace 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

Route of exposure

Long term exposure, Systemic, Dermal

Contributing scenarios

Not applicable.

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

Justification

Not applicable.

has been derived

has been derived.

has been derived.

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% - 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, 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,	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal Long term exposure, Local, Inhalable	Not applicable. Not applicable	Not applicable. Not applicable.	Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	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	•		
Route of exposure Long term exposure, Systemic, Dermal	Contributing scenarios Not applicable.	Dose/Concentration 0.214	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are
Long term exposure, Systemic, Inhalable	Not applicable.	0.121	below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, 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
Short term exposure, Local, Inhalable	Not applicable.	0.243	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

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 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.

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

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



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
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Contributing scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available. Regional use tonnage (tonnes/year): 4840 Fraction of Regional tonnage used locally: 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: 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

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 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

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: 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 ³ (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Not available

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 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. Continuous release. Frequency and duration of use:

Emission Days (days/year):

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 207/292 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

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: 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): 46.5 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):

Environment factors not influenced by risk management:

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:

186

1000

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:

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 (%):

Not available.

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 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:

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

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.

4840

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

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): 232 773 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:

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:

Technical on-site 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 None.

1.00x10-3

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.

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): 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

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

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 ³ (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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%.

=>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:

Not available. Fraction of EU tonnage used in region:

5580 Regional use tonnage (tonnes/year): 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.

220 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

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 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) 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 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): 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. Frequency and duration of use: Continuous release.

365 Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

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 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 2.2: 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:

Frequency and duration of use:

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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Liquid. Covers concentrations up to 2%

Not applicable.

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

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

Indoor, professional setting

Not applicable.

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Non industrial spraying

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor. professional setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

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 90%

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.

FUSES calculation

Justification

Total release for regional

EUSES calculation

n Fresh water mg/l

Marine water mg/l Intermittent release, mg/l Not applicable.

Fresh water sediment mg/kg dwt

Local concentration PEC aquatic (local+regional)

EUSES calculation 4.37x10-4 4.34x10-5 **EUSES** calculation Not applicable. Not applicable. PEC sediment (local+regional) **Justification**

Not evaluated.

Local concentration

0.221

EUSES calculation

Justification

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 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.

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	Total release for regional	Justification
	(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]
	Value	Justification	
Concentration in sewage (PECstp)	Not applicable as there is no	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. **Justification Local concentration** PEC aquatic (local+regional) 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 Justification** PEC sediment (local+regional) 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** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation dwt Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Not evaluated. Groundwater mg/l 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 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 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 3: Electroplating.

Waste water 0.388 Surface water Not evaluated. air (direct + STP) 0 Soil (direct releases only) Not evaluated. Value Concentration in sewage (PECstp) 0.121 mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l 1.20x10-4 Marine water mg/l Not applicable. Local concentr	19.2 4.8 30.3 0 Justification EUSES calcu	EUSE EUSE Table	ES calculation ES calculation ES calculation ES calculation PR16.23 [REACH]
air (direct + STP) Soil (direct releases only) Not evaluated. Value Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l Not applicable.	30.3 0 Justification EUSES calcu	EUSE Table	ES calculation
Soil (direct releases only) Not evaluated. Value Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l Not applicable.	0 Justification EUSES calcu	Table	
Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l Value Local concentr 1.20x10-4 Not applicable.	Justification EUSES calcu		R16.23 [REACH]
Concentration in sewage (PECstp) mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l 0.121 183 Local concentr 1.20x10-4 1.92x10-4 Not applicable.	EUSES calcu		
mg/l Concentration in sewage sludge mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l Not applicable.		lation	
mg/kg dwt Local concentr Fresh water mg/l Marine water mg/l Intermittent release. mg/l Not applicable.	EUSES calcu		
Fresh water mg/l Marine water mg/l Intermittent release. mg/l Not applicable.		lation	
Marine water mg/l 1.92x10-4 Intermittent release. mg/l Not applicable.	ation PEC aquatic	(local+regional) Justif	fication
Intermittent release. mg/l Not applicable.	5.58x10-4	EUSE	ES calculation
	2.36x10-4	EUSE	ES calculation
Local concentr	Not applicable	e. Not ap	pplicable.
	ation PEC sedimer	nt (local+regional) Justif	fication
Fresh water sediment mg/kg dwt Not evaluated.	0.282	EUSE	ES calculation
Marine water sediment mg/kg dwt Not evaluated.	0.119	EUSE	ES calculation
Local concentr	ation PEC soil (loc	al+regional) Justit	fication
Agricultural soil averaged mg/kg 0 dwt	0.077	EUSE	ES calculation
Grassland averaged mg/kg dwt 0	0.077	EUSE	ES calculation
Groundwater mg/l Not evaluated.	7.69x10-4	EUSE	ES calculation
Local concentr	ation PEC air (loca	ıl+regional) Justif	fication
During emission mg/m³ 6.24x10-11	0.077	EUSE	ES calculation
Annual average mg/m³ 1.24x10-10	0.077	EUSE	ES calculation
Annual deposition mg/m²/d Not evaluated.	7.69x10-4	EUSE	ES calculation
Local concentr	ation PEC aquatic	(local+regional) Justif	fication
Micro-organism mg/l Not applicable.		e. Not a	

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

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, ERC08f, ERC11a, ERC12a, ERC12b

Groundwater mg/l Not evaluated. 7.70x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation 7.93x10-6 Annual average mg/m³ 6.52x10⁻⁶ 6.52x10-6 **EUSES** calculation Annual deposition mg/m²/d 1.38x10-5 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 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

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

Intermittent release. mg/l Fresh water sediment mg/kg dwt Marine water sediment mg/kg dwt	Not applicable. Local concentration Not evaluated. Not evaluated.	Not applicable. PEC sediment (local+regional) 0.221 0.022	Not applicable. Justification EUSES calculation 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	0.010	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/m ³	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

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

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

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 Contributing scenario controlling wo		ial spraving	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	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
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.	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

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

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	21.	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:

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

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 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: 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

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 (%):

Not available

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.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Fraction of EU tonnage used in region: Not available.

Regional use tonnage (tonnes/year): 1860 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. Continuous release. Frequency and duration of use:

Emission Days (days/year):

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

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

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:

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): 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

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:

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 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:

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

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:

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:

4840

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 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 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable.

Amounts used:

Not available. 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): 232 773 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 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):

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

Not available.

0.01

Not available

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 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.

220 Emission Days (days/year):

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

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

preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11

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

Sector of end use: SU22

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

ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

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 ³ (%): Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

None.

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%.

=>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:

Not available. Fraction of EU tonnage used in region: 5580 Regional use tonnage (tonnes/year): 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.

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

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.

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 226/292 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) 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 (%):

Not available.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 2.1: Control of environmental exposure

Contributing scenario controlling environmental exposure for 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): 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. Frequency and duration of use: Continuous release.

365 Emission Days (days/year):

Environment factors not influenced by risk management:

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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

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

1860

None.

5.00x10-3

0.01

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.

=>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 227/292 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: Other given operational conditions affecting workers Default breathing volume Light work 10 m³/d Default Body weight: Workers: 70 kg

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

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: 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

	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 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

Justification Local concentration PEC soil (local+regional) 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 Justification **Local concentration** PEC air (local+regional) **EUSES** calculation During emission mg/m³ Not evaluated. 3.94x10-10 0 **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 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 ³	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

1	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 ³	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
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 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 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/day	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 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 7.70x10⁻⁴ **EUSES** calculation Not evaluated. **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 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.

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

Justification Local concentration PEC sediment (local+regional) Fresh water sediment mg/kg dwt 0.221 EUSES calculation Not evaluated Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation PEC soil (local+regional) **Local concentration Justification** 7.73x10⁻⁵ 0.077 **EUSES** calculation Agricultural soil averaged mg/kg 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 3.08x10⁻⁶ 3.08x10⁻⁶ **EUSES** calculation Annual average mg/m³ 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	0.010	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 14

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 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, 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 Contributing scenario controlling we		rial spraying	
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 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,	Not applicable	Not applicable.	Since the substance is not classified for
Dermal			acute effects and therefore, no acute DNEL has been derived.

Not applicable.

Not applicable.

Not applicable.

1.22

Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

Short term exposure, Systemic,

Short term exposure, Local,

Short term exposure, Local, Dermal Not applicable

Inhalable

Combined

Inhalable

Not applicable

Not applicable

Not applicable.

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

Process Category: PROC08a, PROC11

Since the substance is not classified for

Since the substance is not classified for

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

The ECETOC TRA tool has been used to

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

has been derived.

has been derived.

has been derived.

below this value

acute effects and therefore, no acute DNEL

acute effects and therefore, no acute DNEL

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

Sector of end use: SU22

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

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

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

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:

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:

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.

n

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:

2000 Assumed domestic sewage treatment plant flow (m³/d):

Section 2.2: Control of worker exposure

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

(multistage and/or significant contact)

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers Indoor, industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

Product characteristics: Liquid. Covers concentrations up to 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:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 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).

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:

Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

from source towards the worker:

Not applicable.

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%

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 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.

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 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

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: Treatment of articles by dipping and pouring

Product characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Other given operational conditions affecting workers

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:

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.

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).

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.

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,

Personal protection:

dispersion and exposure:

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

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

management supervision controls.

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% - 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 3:.2 Workers - Exposure esti	mation		
	orker exposure for 0: Mixing or b	lending in batch processes	for formulation of preparations* and articles
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 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 esti		v anavatiana	
Contributing scenario controlling wo		-	
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 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 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

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 1.22 Short term exposure, Local, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3:.2 Workers - Exposure estimation Contributing scenario controlling worker exposure for 2: 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, Not applicable. 0.110 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, The ECETOC TRA tool has been used to Not applicable. 0.305 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. 0.61 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 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, 0.055 Not applicable. estimate workplace exposures unless **Dermal** otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.61 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable and Not evaluated. Not applicable. Combined Tetraethylenepentamine, TEPA Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely

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

ong 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

including weighing) Route of exposure	Contributing scenarios	Dose/Concentration	to small containers (dedicated filling line,
Long term exposure, Systemic, Dermal	Not applicable.	0.055	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable 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, 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. Since the substance is not classified for Not applicable.

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

acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived. 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

Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

Short term exposure, Local,

Combined

Inhalable

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 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

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 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.	0.61	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

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



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

Section 2.1:	Control o	f environmental	exposure
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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

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

n

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.

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 domestic 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

Indoor, industrial setting

Other given operational conditions affecting workers

exposure:

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

ivoi applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: 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

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Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

management supervision controls.

Section 2.2: Control of worker exposure

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

containers at non-dedicated facilities

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

Frequency and duration of use: 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:

Default breathing volume Light work 10. In 7d 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.

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 246/292 Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large

containers at dedicated facilities

Product characteristics: Liquid. Covers concentrations up to 0.5%

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

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:

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

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Indoor, industrial setting

including weighing)

Product characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used:

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

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

(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:

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 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

Indoor. industrial setting

Other given operational conditions affecting workers

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 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 Indoor. industrial setting

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 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

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

EUSES calculation Agricultural soil averaged mg/kg 3 27x10-6 0.077 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 **FUSES** calculation PEC aquatic (local+regional) Local concentration **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

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Long term exposure, Systemic,

Inhalable

Not applicable.

0.76

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

Long term exposure, Systemic,

Combined

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

Inhalable

Short term exposure, Systemic,

Dermal

Short term exposure, Systemic,

Inhalable

Short term exposure, Systemic,

Combined

Short term exposure, Local, Dermal

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable. 1.52

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 3:.2 Workers - Exposure estimation

Contributing scenario controlling worker exposure for 1: Calendering operations

Dose/Concentration Contributing scenarios Route of exposure

Long term exposure, Systemic,

Long term exposure, Systemic,

Dermal

Inhalable

Not applicable.

Not applicable.

0.027

0.76

Justification The ECETOC TRA tool has been used to

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

below this value

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

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

below this value

Not applicable.

Long term exposure, Systemic,

Combined

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

Inhalable

Short term exposure, Systemic, **Dermal**

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: 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. Short term exposure, Local, Not applicable. 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 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** 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 and Not evaluated. Not applicable. 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. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable 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. 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 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. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.76 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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

250/292

Subsequent service life relevant for that use: No.

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** Not applicable. Short term exposure, Systemic, 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 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 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.027 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 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. Long term exposure, Local, Not applicable. Not applicable. Not applicable. Inhalable Not applicable. Short term exposure, Systemic, Not applicable. Not applicable. **Dermal** Short term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable 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

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,

Dermal

Not applicable.

below this value

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

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

otherwise indicated. 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

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,

Combined

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

Not applicable and Not evaluated. 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

Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL **Combined** has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.52 The ECETOC TRA tool has been used to 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 Not applicable. 0.76 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

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

Not applicable. Long term exposure, Local, Dermal Not applicable. Not applicable. Long term exposure, Local, Not applicable. Not applicable. 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. 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 7: Using material as fuel sources, limited exposure to unburned product to be expected

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

exposure estimates for other PROC are

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

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 o	f environmental e	exposure
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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

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 (%):

7.36x10-4

n

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

Organisational measures to prevent/limit release from site:

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:

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 1: Calendering operations

Product characteristics: Liquid. Covers concentrations up to 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.

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 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:

Not applicable.

Not applicable.

Not applicable.

Indoor. professional setting

Other given operational conditions affecting workers

exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

management supervision controls.

Section 2.2: Control of worker exposure

Contributing scenario controlling worker exposure for 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:

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.

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

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

management supervision controls.

Indoor, professional setting

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:

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.

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 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.

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,

Personal protection:

dispersion and exposure:

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

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
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

Long term exposure, Local, Dermal Long term exposure, Local, Inhalable	Not applicable and 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.
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
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
Dermal	Not approach.		estimate workplace 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 we containers at non-dedicated facilities Route of exposure Long term exposure, Systemic,		Substance or preparation (char- Dose/Concentration 0.110	rging/discharging) from/to vessels/large Justification The ECETOC TRA tool has been used to
Section 3:.2 Workers - Exposure est			
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Combined Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Inhalable Long term exposure, Systemic,	Not applicable.	Not applicable.	Not applicable.
Dermal Long term exposure, Systemic, Long term exposure, Systemic,	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Route of exposure Long term exposure, Systemic,	Contributing scenarios	Dose/Concentration	Justification Not applicable
Contributing scenario controlling we		g operations	
Inhalable Section 3:.2 Workers - Exposure esti	imation		
Short term exposure, Local, Dermal Short term exposure, Local,	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Inhalable Short term exposure, Systemic, Combined	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.
Long term exposure, Local,	Not applicable.	Not applicable.	Not applicable.
Combined Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable Long term exposure, Systemic,	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
(multistage and/or significant contact	Ct)		

Tetraethylenepentamine, TEPA

Section 3:.2 Workers - Exposure estimation

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, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3:.2 Workers - Exposure est	imation		
•		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.	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.
Section 3:.2 Workers - Exposure est	imation		
		substance or preparation into sm	nall containers (dedicated filling line,
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, 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 esti			
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, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3:.2 Workers - Exposure estimation

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, 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 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 n

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.

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

Justification

management supervision controls.

Total release for regional

exposure estimation kg/day

Section 3:: Exposure estimation

Section 3:.1 Environment - Exposure estimation

Contributing scenario controlling environmental exposure for 0: Fuel additive.

day Waste water 19.2 **EUSES** calculation **Surface water** Not evaluated. 48 **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** Not applicable as there is no Concentration in sewage (PECstp) **EUSES** calculation

release to wastewater.

ma/l

Concentration in sewage sludge

mg/kg dwt

Not applicable as there is no release to wastewater.

Release from point source

(local exposure estimation) kg/

FUSES calculation

Local concentration PEC aquatic (local+regional) **Justification** Fresh water mg/l 4.37x10-4 **EUSES** calculation

0 4.34x10-5 **EUSES** calculation Marine water mg/l Intermittent 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 0.022 Marine water sediment mg/kg dwt Not evaluated **FUSES** calculation **Local concentration** PEC soil (local+regional) Justification

Agricultural soil averaged mg/kg 3.27x10-6 0.077 **EUSES** calculation

6.48x10-6 0.077 Grassland averaged mg/kg dwt **FUSES** calculation

7.69x10-4 Groundwater mg/l Not evaluated. **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 **Justification Local concentration** PEC aquatic (local+regional) Not applicable. Micro-organism mg/l 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 Route of exposure **Contributing scenarios Justification Dose/Concentration** The ECETOC TRA tool has been used to Long term exposure, Systemic, 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 Long term exposure, Systemic, Not applicable and Not evaluated. Not applicable Not applicable. Combined Not applicable and Not evaluated. Not applicable. Long term exposure, Local, Dermal Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Not applicable. Short term exposure, Systemic, Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Systemic, Combined

Short term exposure, Local,

Inhalable

Short term exposure, Local, Dermal Not applicable

Not applicable

Not applicable.

Not applicable.

1.52

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

> has been derived Since the substance is not classified for

Not applicable. acute effects and therefore, no acute DNEL

has been derived.

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

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

Environment Not available. 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.

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



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

Section 2	1: Cor	trol 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. 4840 Regional use tonnage (tonnes/year): 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.

Continuous release. 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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site 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

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% -

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 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 1160 5273 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 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:

Treat air 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

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% 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:

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% -

Process Category: PROC21, PROC24

Sector of end use: SU22

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

266/292

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

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 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:

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): 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

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

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.

None.

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.

=>37.4

Tetraethylenepentamine, TEPA

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

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

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC11a

267/292

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: Not applicable.

Amounts used:

Not available 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 5500 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

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:

4840

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.

Conditions and measures related to municipal sewage treatment plant:

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:

Not available. Fraction of EU tonnage used in region:

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.

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

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% -

Process Category: PROC21, PROC24

Sector of end use: SU22

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

268/292

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:

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: Not available.

4840 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: 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

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.

220

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% -

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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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:

5580 Regional use tonnage (tonnes/year): 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:

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):

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:

Continuous release

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. 1860 Regional use tonnage (tonnes/year): 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

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: 1000 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

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

365

5.00x10-3

0.01

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%.

Not available

=>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 m³/d Default Body weight: Workers: 70 kg

Indoor. professional setting

Other given operational conditions affecting workers

Not applicable.

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

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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.

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:

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

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	2 . 1	Environment	- Evnocuro	actimation
Section	J	Environmen	i - Exposure	esumation

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 Justification PEC soil (local+regional) 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 Justification **Local concentration** PEC air (local+regional) EUSES calculation During emission mg/m³ Not evaluated. 0 Annual average mg/m³ 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
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

3	Local concentration	PEC air (local+regional)	Justification
Groundwater mg/l	Not evaluated.	7.69x10-4	EUSES calculation
Grassland averaged mg/kg dwt	2.70x10-11	0.077	EUSES calculation
Agricultural soil averaged mg/kg dwt	1.36x10-11	0.077	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Marine water sediment mg/kg dwt	Not evaluated.	0.051	EUSES calculation
Fresh water sediment mg/kg dwt	Not evaluated.	0.239	EUSES calculation
	Local concentration	PEC sediment (local+regional)	Justification
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
Marine water mg/l	5.73x10-5	1.01x10-4	EUSES calculation
Fresh water mg/l	3.59x10-5	4.73x10-4	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
mg/kg dwt			
Concentration in sewage sludge	54.6	EUSES calculation	
Concentration in sewage (PECstp) mg/l	0.036	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	0.115	19.2	EUSES calculation
	day	onposition ingrasiy	

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

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** 1.20x10-4 **EUSES** calculation Fresh water mg/l 5.58x10-4 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 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation 7.70x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. Local concentration PEC air (local+regional) **Justification EUSES** calculation During emission mg/m³ 7.93x10-6 Not evaluated. Annual average mg/m³ 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.

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	4.37x10⁴	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

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

During emission mg/m³ 0 Not evaluated. **EUSES** calculation Annual average mg/m³ O 3 94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation PEC aquatic (local+regional) Local concentration Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2 Workers - Exposure est	imation		
Contributing scenario controlling we	orker exposure for 0: Low ene	rgy manipulation of substances	s 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

The ECETOC TRA tool has been used to

Long term exposure, Systemic, 0.06 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, Combined

Not evaluated.

Not applicable.

Not applicable.

Not applicable.

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

Not evaluated. 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

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

Contributing scenarios Dose/Concentration Route of exposure **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

Long term exposure, Systemic, Combined

Not applicable.

Not applicable.

Not applicable.

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

Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. 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% -

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

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

277/292

Short term exposure, Systemic, Combined

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Local, Not applicable.

Inhalable

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

Not available. **Environment** Health Not available.

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

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



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

Maximum daily site tonnage (kg/day): Continuous release. 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

Other given operational conditions affecting environmental exposure:

Release fraction to air from process (initial release prior to

Release fraction to soil from process (initial release prior to

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Release fraction to air from wide dispersive use (regional

only):

Release fraction to soil from wide dispersive use (regional

Release fraction to wastewater from wide dispersive use:

Technical conditions and measures at process level (source) to

Technical on-site 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.

7.36x10-4

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% -

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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Section 2.1: Control of environmental exposure

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

Operational conditions: Indoor/Outdoor use.

Product characteristics: Not applicable

Amounts used:

Fraction of EU tonnage used in region:

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

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

Emission Days (days/year):

Environment factors not influenced by risk management:

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

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

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:

exposure:

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): 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 Other given operational conditions affecting environmental 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

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

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:

Fraction of EU tonnage used in region:

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.

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 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

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.

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%.

=>37.4

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

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:

Not available 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 5500 Average Local Daily Tonnage (kg/day):

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: 1000 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: Treat air emission to provide a typical removal efficiency of

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

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

4840

7.36x10-4

1.00x10-3

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

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

If discharging to domestic sewage treatment plant, provide

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 5: Corrosion inhibitor.

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): 930 25% Fraction of Regional tonnage used locally: 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.

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

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 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:

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.

7.36x10-4

1.00x10-3

1.00x10-3

Not available.

Not available.

Not applicable.

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.

4840 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: Continuous release.

220 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

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:

prevent release: 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

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

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

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

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): 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): Continuous release 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 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:

Treat air 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

Not available

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

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

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

365

None.

0.01

5.00x10-3

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

Not available

Section 2.2: Control of worker exposure

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

Product characteristics: Solid. Covers concentrations up to 2%

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

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

Other given operational conditions affecting workers 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,

Personal protection:

Not applicable.

Not applicable.

Not applicable.

dispersion and exposure:

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

management supervision controls.

Section 2.2: Control of worker exposure

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

Product characteristics: Solid. Covers concentrations up to 2%

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

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:

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

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	2 . 1	Environment	- Evnocura	actimation
Section	J	Environment	- EXDUSULE	esumation

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

Justification Local concentration PEC soil (local+regional) 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 Annual average mg/m³ 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 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	
Fresh water mg/l	Local concentration 1.20x10-4	PEC aquatic (local+regional) 5.58x10-4	Justification 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

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	Vacanication
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/ 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

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** 1.20x10-4 **EUSES** calculation Fresh water mg/l 5.58x10-4 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 1.64x10-4 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.24x10-4 0.077 **EUSES** calculation 7.70x10-4 **EUSES** calculation Groundwater mg/l Not evaluated. Local concentration PEC air (local+regional) **Justification EUSES** calculation During emission mg/m³ 7.93x10-6 Not evaluated. Annual average mg/m³ 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.

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

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/m³ O Not evaluated. **EUSES** calculation Annual average mg/m³ O 3 94x10-10 **EUSES** calculation Annual deposition mg/m²/d Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3:.2	2 Workers -	Exposure	estimation
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Contributing scenario controlling worker exposure for 0: Low energy manipulation of substances bound in materials and/or articles

Dose/Concentration Contributing scenarios 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

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 Not applicable. acute effects and therefore, no acute DNEL

has been derived.

Not applicable.

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

Contributing scenarios Dose/Concentration Route of exposure **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% -

Process Category: PROC21, PROC24

Sector of end use: SU22

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

291/292

Short term exposure, Systemic, 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.

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. 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.