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% - Professional

Handling of solid products with small amounts of unbound ethylenamines - 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 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

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

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

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

Telephone number : AkzoNobel Chemicals-Deventer-NLT +31 570 679211 (24hours/7days)

F +31 570 679801

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. 1A, 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

Hazard statements : Harmful if swallowed.

Harmful 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.

SECTION 2: Hazards identification

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

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

Immediately call a POISON CENTER or physician.

Storage : Store locked up. **Disposal** : Not applicable.

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 : Not applicable.

SECTION 3: Composition/information on ingredients

Substance/mixture : Multi-constituent substance

			Classification		
Product/ingredient name	Identifiers	%	67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	Type
Amines, polyethylenepoly-, tetraethylenepentamine fraction	REACH #: 01- 2119487290-37 EC: 292-587-7 CAS: 90640-66-7 Index: 612-065-00-8	100	Xn; R21/22 C; R34 R43 N; R51/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1A, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[*]
3,6,9- triazaundecamethylenediamine	EC: 203-986-2 CAS: 112-57-2 Index: 612-060-00-0	30 - 70	Xn; R21/22 C; R34 R43 N; R51/53	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1A, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[A]
			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

SECTION 3: Composition/information on ingredients

- [*] 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

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

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SECTION 4: First aid measures

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

5.3 Advice for firefighters

Special precautions for fire-fighters

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

Special protective equipment for fire-fighters

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

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

For emergency responders:

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

SECTION 6: Accidental release measures

6.2 Environmental precautions

: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. 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 (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

6.4 Reference to other sections

: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

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

7.1 Precautions for safe handling

Protective measures

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

Advice on general occupational hygiene

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s)

Recommendations : N Industrial sector specific : N 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.

procedures

Recommended monitoring: 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 European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Derived effect levels

Product/ingredient name	Type	Exposure	Value	Population	Effects
Amines, polyethylenepoly-, tetraethylenepentamine fraction	DNEL	Short term Inhalation	6940 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	0.74 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	1.29 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	0.036 mg/cm 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
	DNEL	Long term Dermal	0.56 mg/cm²	Consumers	Local

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 PNEC PNEC PNEC	Fresh water sediment Marine water sediment Soil Sewage Treatment Plant	6.8 µg/l 0.341 mg/kg dwt 0.746 mg/kg dwt 0.274 mg/kg dwt 4.6 mg/l 0.23 mg/kg	Assessment Factors Assessment Factors Assessment Factors

8.2 Exposure controls

Appropriate engineering controls

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

Individual protection measures

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SECTION 8: Exposure controls/personal protection

Hygiene measures

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

Eye/face protection

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

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. >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.

Odour threshold : Not available.

pH : 13.5

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

Initial boiling point and boiling : 375°C

range

: 3/5 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.

Vapour pressure : <0.001 kPa [20°C]

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

Solubility(ies) :

>1000 g/l

Partition coefficient: n-

octanol/water

: -3.16

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SECTION 9: Physical and chemical properties

: 330°C

Auto-ignition temperature

Decomposition temperature : Not available.

: Dynamic: 80 mPa·s **Viscosity**

Explosive properties : Not available.

Oxidising properties : None.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

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

10.2 Chemical stability : The product is stable.

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

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

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

Chlorinated hydrocarbon.

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

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

Conclusion/Summary Inhalation No applicable toxicity data Cannot be classified.

> Oral No additional information. Dermal No additional information.

Irritation/Corrosion

Conclusion/Summary

Skin : Corrosive to the skin. **Eves** : Corrosive to eyes.

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

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.

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SECTION 11: Toxicological information

Respiratory

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

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Amines, polyethylenepoly-, tetraethylenepentamine fraction	-	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary

: No mutagenic effect.

Carcinogenicity

Conclusion/Summary: skin No carcinogenic effect.

Reproductive toxicity

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

considered to be applicable.

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

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

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

doses of a related salt.

Teratogenicity

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

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely

routes of exposure

: Routes of entry anticipated:Oral.

Potential acute health effects

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.

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SECTION 11: Toxicological information

Potential delayed effects: No specific data.

Long term exposure

Potential immediate

effects

: No specific data.

Potential delayed effects: No specific data.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
Amines, polyethylenepoly-, tetraethylenepentamine fraction	Sub-chronic LOAEL Oral	Rat	43 mg/kg	26 weeks
ITACIIOTT	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.

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

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
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	Micro-organism Algae Daphnia Fish	- 72 hours 48 hours 96 hours

Conclusion/Summary

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

12.2 Persistence and degradability

Conclusion/Summary

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

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

12.3 Bioaccumulative potential

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

12.4 Mobility in soil

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SECTION 12: Ecological information

Soil/water partition coefficient (Koc)

: 4000

Mobility : No specific data.

12.5 Results of PBT and vPvB assessment

PBT : No.

vPvB : No.

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

SECTION 13: Disposal considerations

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

13.1 Waste treatment methods

Product

Methods of disposal

: The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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.

Hazardous waste

Packaging

Methods of disposal

- : The classification of the product may meet the criteria for a hazardous waste.
- : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions

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

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SECTION 14: Transport information

	ADR/RID	ADN/ADNR	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	Not available.	Not available.	Not available.	Not available.

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SECTION 14: Transport information

Additional information	Hazard identification number	-	Emergency schedules (EmS)	Passenger and Cargo Aircraft
mormation	80		F-A, S-B	Quantity limitation: 5 L
			,	Packaging
	Limited quantity			instructions: 852
	5 L			Cargo Aircraft Only
				Quantity limitation:
	Tunnel code			60 L
	(E)			Packaging
	,			instructions: 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.

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

prevention and control

list (IPPC) - Air

Integrated pollution prevention and control

list (IPPC) - Water

International regulations

Chemical Weapons Convention List Schedule I

Chemicals

: Not listed

: Not listed

Chemical Weapons Convention List Schedule II

Chemicals

: Not listed

Chemical Weapons Convention List Schedule III

Chemicals

: Not listed

Tetraethylenepentamine, TEPA

SECTION 15: Regulatory information

15.2 Chemical Safety

: Complete.

Assessment

15.3 Registration status : Applicable.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and

: ATE = Acute Toxicity Estimate

acronyms

1272/2008]

DNEL = Derived No Effect Level

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

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

Classification	Justification
Acute Tox. 4, H302	Expert judgment
Acute Tox. 4, H312	Expert judgment
Skin Corr. 1A, 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

statements

Harmful if swallowed. : H302

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H411 Toxic to aquatic life with long lasting effects.

Full text of classifications

[CLP/GHS]

ACUTE TOXICITY: ORAL - Category 4 : Acute Tox. 4, H302 ACUTE TOXICITY: SKIN - Category 4 Acute Tox. 4, H312

Aquatic Chronic 2, H411 AQUATIC TOXICITY (CHRONIC) - Category 2

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

CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No.

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

Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1

Full text of abbreviated R

phrases

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

R34- Causes burns.

R43- May cause sensitisation by skin contact.

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

aquatic environment.

Full text of classifications

[DSD/DPD]

: C - Corrosive

Xn - Harmful

: 12/11/2010

N - Dangerous for the environment

Date of issue/ Date of

Date of previous issue

revision

: 25 February 2011

Version : 4

Notice to reader

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

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

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 scenario 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.

List of use descriptors 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.

Processes and activities covered

by the exposure scenario

Not applicable.

Assessment Method See Section 3

Section 2: Operational conditions and risk management measures

Section 2.1: Control of consumer exposure

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 Categories 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 Categories 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 Categories 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 Categories 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%

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.

7233

Section 2.2: Control of environmental exposure Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% 1274 Average Local Daily Tonnage (kg/day)

Frequency and duration of use: Continuous release.

Section 3: Exposure estimation and reference to its source

Section 3.1: Exposure estimation - Consumers

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

Scenario: substance in the article::

Exposure estimation and

reference to its source -Consumers: 0:

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

Adhesives, sealants -

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

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

Inhalation:

evaporation Mode of release:

Exposure estimation and reference to its source -

Consumers: 1:

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

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

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

Scenario Molecular (Update model):

weight (g/mole):

32.9 20: 500: 100: 50 3 09F+03 550 20 1

Dermal:

Application methods: instant

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

area) cm2: model):

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

Inhalation mg/m³

(Concentration on day of

exposure):

0.039; 0.188; 0.040; 0.191

Dermal load (mg/cm2):

bw):

Dermal (Internal dose) mg/kg bw/day:

Inhalation (mg/kg/day) Long

6.25; 0.12; 2.5; 0.46 0.208; 0.08; 0.08; 1.67 0.002; 0.001; 5E-4; 0.001

Dermal (External dose) mg/kg

bw/day:

Inhalation event/Exposure

mg/m³ (Short term exposure):

Dermal systemic exposure

(Long term exposure):

Dermal External dose (mg/kg

(external dose) with gloves (90% efficiency) mg/kg bw/day

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

Section 3.2 Exposure estimation-Consumers

Contributing exposure scenario controlling worker exposure for 0:

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

Not applicable.

Not applicable.

Not applicable.

Long term exposure, Systemic,

Not applicable. Inhalable

Not applicable. Not applicable.

Long term exposure, Systemic, Not applicable.

Combined

Not applicable.

Not applicable.

Long term exposure, Local, Dermal Not applicable.

Not applicable.

Not applicable.

Long term exposure, Local, Inhalable

Dermal

Not applicable.

Not applicable.

Not applicable.

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

Not applicable. Not applicable.

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.

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

Section 3.3 Environment Exposure estimation Contributing exposure scenario controlling environmental exposure for 1: Total release for regional **Justification** Release from point source (local exposure estimation) exposure estimation kg/day kg/day **Waste water** 0.010 19.2 **EUSES** calculation Not evaluated. 4.8 **EUSES** calculation **Surface water** air (direct + STP) 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. Not applicable. 0 **Value Justification** Concentration in sewage (PECstp) 3.19x10-3 **EUSES** calculation mg/l Concentration in sewage sludge 4 82 **EUSES** calculation mg/kg dwt 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. **Justification** Local concentration PEC sediment (local+regional) 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 2.00x10-12 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.96x10-12 0.077 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated 7 69x10-4 PEC air (local+regional) Local concentration Justification During emission mg/m³ 7.96x10-14 Not evaluated. **EUSES** calculation 3.94x10-10 **EUSES** calculation Annual average mg/m³ 7.96x10-14 Annual deposition mg/m2/d 1.69x10-13 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration Justification**

Section 4: Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Not applicable.

Environment Not available. Health Not available.

Not applicable.

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

Environment Not applicable. Health Not applicable. dditional guidance Not applicable

Tetraethylenepentamine, TEPA

Micro-organism mg/l

Identified use name: Consumer uses of ethyleneamines

Not applicable.

Sector of end use: SU21

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

ERC08e, ERC08f

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

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

Multi-constituent substance Tetraethylenepentamine, TEPA

Section 1: Title

Product definition

Product name

Short title of the exposure scenario 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

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of List of use descriptors

preparations containing EA up to 0.5% - Professional

Process Category: PROC21, PROC24

Sector of end use: SU22

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

Section 2: Operational conditions and risk management measures

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker 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 2.1 Control of worker exposure

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

and/or articles

Product Characteristics: Solid. Covers concentrations up to 0.5%

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

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

Other operational conditions affecting worker exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

Not applicable.

Organisational measures to prevent/limit releases,

from source towards the worker:

Not applicable.

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.

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

Professional

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 4033

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

7.36x10-4

Not applicable

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

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) No wastewater treatment required.

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

7.36x10-4

Not applicable.

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

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

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

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

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

0.5% - Professional Process Category: PROC21, PROC24

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 2114

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

5.00x10-4 1.00x10-2

Not applicable.

5.00x10-3

Not applicable.

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

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.

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1210 Average Local Daily Tonnage (kg/day): 5500

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

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):

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) =>37.4 to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Regional use tonnage (tonnes/year): 4840

None Other operational conditions of use affecting environmental

7.36x10-4

1.00x10-3

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%.

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor. Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

7.36x10-4

1 00x10-3

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.

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%.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

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

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%): Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure:

Tetraethylenepentamine, TEPA

Release fraction to air from process (initial release prior to

RMM):

7.36x10-4

7.36x10-4

1.00x10-3

1.00x10-3

Not applicable.

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

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

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

0.5% - Professional Process Category: PROC21, PROC24

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

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 1274

Continuous release.

365 Emission Days (days/year):

Environmental factors not influenced by risk management:

1000 None. Other operational conditions of use affecting environmental

Release fraction to air from process (initial release prior to

RMM):

RMM):

prior to RMM):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

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

Organisational measures to prevent/limit release from site:

Regional use tonnage (tonnes/year): 1860

Frequency and duration of use:

Local marine water dilution factor:

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

Release fraction to wastewater from process (initial release 0.01

Not applicable.

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

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

Conditions and measures related to municipal sewage treatment plant:

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

articles

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

Not applicable.

Long term exposure, Systemic,

Dermal

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

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.

Long term exposure, Systemic, 0.02 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the 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, 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. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable 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 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation

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

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

Inhalable Short term exposure, Systemic,

Dermal

Short term exposure, Systemic, Inhalable

Short term exposure, Systemic, Combined

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Local, Inhalable

Not applicable.

Total release for regional

Not applicable.

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

Not applicable.

Not applicable.

Justification

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Release from point source

(local exposure estimation) exposure estimation kg/day kg/day **EUSES** calculation Waste water n 192 **Surface water** Not evaluated. 48 **EUSES** calculation air (direct + STP) 30.3 EUSES calculation Soil (direct releases only) Not evaluated. Not applicable. **Justification** Value Concentration in sewage (PECstp) Not applicable as there is no **FUSES** calculation release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation

mg/kg dwt release to wastewater. **Local concentration**

PEC aquatic (local+regional) **Justification** 0 4.37x10-4 **EUSES** calculation 0 4.34x10-5 **EUSES** calculation

Tetraethylenepentamine, TEPA

Fresh water mg/l

Marine water mg/l

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

Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Not evaluated. 0.221 Fresh water sediment mg/kg dwt **EUSES** calculation 0.022 Marine water sediment mg/kg dwt Not evaluated. **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 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 Not evaluated. **EUSES** calculation Annual average mg/m³ 3.94x10-10 **EUSES** calculation Annual deposition mg/m2/d Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Justification** Local concentration Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge	Not applicable as there is no	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

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	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

	(local exposure estimation) kg/day	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	Not applicable.
	Value	Justification	

 $Tetra ethylene pentamine, \ TEPA$

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

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Concentration in sewage (PECstp) 0.036 **EUSES** calculation Concentration in sewage sludge 54.6 **EUSES** calculation mg/kg dwt **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l **EUSES** calculation 3.59x10-5 4.73x10-4 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 0.051 Not evaluated. **EUSES** calculation PEC soil (local+regional) **Local concentration Justification** Agricultural soil averaged mg/kg 1.36x10-11 **EUSES** calculation Grassland averaged mg/kg dwt 2.70x10-11 0.077 **EUSES** calculation Groundwater mg/l 7.69x10-4 **EUSES** calculation Not evaluated. PEC air (local+regional) **Local concentration 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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10-6	6.52x10-6	EUSES calculation
Annual deposition mg/m2/d	1.38x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

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

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Annual deposition mg/m2/d 6.52x10-6 Not evaluated. **EUSES** calculation

> PEC aquatic (local+regional) **Local concentration Justification** Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Micro-organism mg/l

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

Total release for regional **Justification** Release from point source

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

0.010 19.2 **EUSES** calculation Waste water **Surface water** Not evaluated. **EUSES** calculation 4.8 30.3 air (direct + STP) **EUSES** calculation

Soil (direct releases only) Not evaluated Not applicable. **Value Justification**

EUSES calculation 3 19x10-3

Concentration in sewage (PECstp)

Concentration in sewage sludge 4.82 **EUSES** calculation

mg/kg dwt

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. **Justification Local concentration** PEC sediment (local+regional) Fresh water sediment mg/kg dwt Not applicable 0.222 **EUSES** calculation Marine water sediment mg/kg dwt 0.024 **EUSES** calculation 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 PEC air (local+regional) **Justification Local concentration**

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 4: Guidance to check compliance with the exposure scenario

Environment Not available Health Not available.

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

Environment Not applicable. Health Not applicable. Additional good practices Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

Product definition Multi-constituent substance Tetraethylenepentamine, TEPA

Section 1: Title

Product name

Short title of the exposure scenario 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

Identified use name: Handling of solid products with small amounts of unbound ethylenamines - Use of List of use descriptors

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 worker exposure

Contributing exposure 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 operational conditions affecting worker 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 2.1 Control of worker exposure

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

and/or articles

Product Characteristics: Solid. Covers concentrations up to 2%

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

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

Other operational conditions affecting worker 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.

Tetraethylenepentamine, TEPA

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

Professional

Professional

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

Subsequent service life relevant for that use: No.

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 4033

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

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) No wastewater treatment required.

Not applicable.

7.36x10-4

7.36x10-4

Not applicable

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

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

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

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 2114

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

5.00x10-4

7.36x10-4

Not applicable.

1.00x10-2

5.00x10-3

Not applicable.

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

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

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None Other operational conditions of use affecting environmental

Release fraction to air from process (initial release prior to

RMM):

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 prior to RMM):

Not applicable.

Technical conditions and measures at process level (source) to

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Release fraction to wastewater from process (initial release

prior to RMM):

0.01

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

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

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

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

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

Not applicable.

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use:

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

Environmental factors not influenced by risk management:

Local marine water dilution factor: None. Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):

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

Conditions and measures related to municipal sewage treatment plant:

4840

Continuous release.

1000

7.36x10-4

1.00x10-3

1.00x10-3

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%.

Treat on-site wastewater (prior to receiving water discharge) =>37.4

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure:

7.36x10-4

Release fraction to air from process (initial release prior to

RMM):

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.

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

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

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Operational conditions: Indoor use.

Amounts used:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 1274

Continuous release.

365 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

Release fraction to air from process (initial release prior to

RMM):

5.00x10-3

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

Technical on-site conditions and measures to reduce or limit

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

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Frequency and duration of use:

Release fraction to soil from process (initial release prior to

prevent release:

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

discharges, air emissions and releases to soil:

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

0.01

Not applicable.

articles

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

Not applicable.

Long term exposure, Systemic,

Dermal

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

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

Long term exposure, Systemic, 0.06 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** 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 Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable. Since the substance is not classified for Not applicable. acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, Not applicable. 0.12 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure scenario controlling worker exposure for 1: High (mechanical) energy work-up of substances bound in materials and/or articles Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, 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. 0.06 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Not applicable. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable. acute effects and therefore, no acute DNEL has been derived. 0.12 The ECETOC TRA tool has been used to

Short term exposure, Local,

Inhalable

Not applicable.

below this value

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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

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

Total release for regional

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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

Tetraethylenepentamine, TEPA

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

Justification

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

Subsequent service life relevant for that use: No.

sequent service life relevant for that use: No. Environmental Release Category: ERC11a 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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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

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

Groundwater mg/l 7.69x10-4 **EUSES** calculation Not evaluated. **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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Justification Release from point source Total release for regional (local exposure estimation) exposure estimation kg/day kg/day Waste water 0.115 19.2 **EUSES** calculation **Surface water** Not evaluated **FUSES** calculation 48 30.3 **EUSES** calculation air (direct + STP) Soil (direct releases only) Not evaluated. Not applicable. **Value Justification** Concentration in sewage (PECstp) 0.036 **EUSES** calculation Concentration in sewage sludge 54.6 **EUSES** calculation mg/kg dwt 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 1.36x10-11 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 2.70x10-11 0.077 **EUSES** calculation Groundwater mg/l 7.69x10-4 **EUSES** calculation Not evaluated. **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 3.2 Environment Exposure estimation

kg/day

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Total release for regional

exposure estimation kg/day

Release from point source

(local exposure estimation)

	kg/uay		
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	Not applicable.
	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

Tetraethylenepentamine, TEPA

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

Justification

Process Category: PROC21, PROC24

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

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

Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.64x10-4 0.077 **EUSES** calculation dwt 0.077 Grassland averaged mg/kg dwt 3.24x10-4 **EUSES** calculation Groundwater mg/l 7.70x10-4 Not evaluated. **EUSES** calculation PEC air (local+regional) **Local concentration Justification** During emission mg/m³ Not evaluated. 7.93x10-6 **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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

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)	0.018	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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.

Total release for regional

Tetraethylenepentamine, TEPA

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

Justification

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

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

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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 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 3.2 Environment Exposure estimation

Contributing exposure 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	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
	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	7.96x10-4	Not evaluated.	EUSES calculation
Annual average mg/m³	7.96x10-4	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 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: 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

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

Product definitionMulti-constituent substanceProduct nameTetraethylenepentamine, TEPA

Section 1: Title

Short title of the exposure scenario 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

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 worker exposure

Contributing exposure 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 operational conditions affecting worker 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.

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 specific activity

management supervision controls.

Section 2.1 Control of worker exposure

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

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

Amounts used: Not applicable.

Frequency and duration of use: Do not carry out operation for more than 4 hours

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

Other operational conditions affecting worker exposure: Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

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

42/233

Industrial

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Personal protection:

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

removal efficiency of (%): 90%

Not applicable.

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

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

minimum efficacy of 90%

Section 2.1 Control of worker exposure

Contributing exposure 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

Not applicable.

Other operational conditions affecting worker 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:

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. Wear appropriate respiratory protection, with a

minimum efficacy of 90%

Section 2.1 Control of worker exposure

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

and articles (multistage and/or significant contact)

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

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

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

Other operational conditions affecting worker exposure: Indoor, industrial 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:

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. Wear appropriate respiratory protection. with a

minimum efficacy of 90%

Section 2.1 Control of worker exposure

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

vessels/large containers at non-dedicated facilities

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

Amounts used: Not applicable.

Frequency and duration of use: Avoid carrying out operation for more than 1 hour.

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

Other operational conditions affecting worker exposure:

Technical conditions and measures at process level

Organisational measures to prevent/limit releases,

(source) to prevent release:

Indoor. industrial setting 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%

Not applicable.

dispersion and exposure: 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

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 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 6: 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 100%

Not applicable. Amounts used:

Frequency and duration of use: Do not carry out operation for more than 4 hours

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

Other operational conditions affecting worker exposure: Indoor, industrial setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

Not applicable.

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

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

Section 2.1 Control of worker exposure

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

Not applicable.

Not applicable.

Not applicable.

removal efficiency of (%): 90%

filling line, including weighing)

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

Amounts used:

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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

from source towards the worker:

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

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

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 2.1 Control of worker exposure

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

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 operational conditions affecting worker exposure: Indoor, industrial 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:

Tetraethylenepentamine, TEPA

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls. Wear appropriate respiratory protection, with a minimum efficacy of 90%

Section 2.2: Control of environmental exposure

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

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

Indoor, industrial setting

7.36x10-4

1.00x10-4

4.84x10-8

=>37 4

wastewater.

7.36x10-4

1 00x10-4

4.84x10-8

Not applicable.

Not applicable.

Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil: Treat air emission 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:

Conditions and measures related to municipal sewage treatment

plant:

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor:

Not applicable. Indoor. industrial setting

Other operational conditions of use 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):

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

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

Treat air emission to provide a typical removal efficiency of

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

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

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

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

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

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

wastewater.

Conditions and measures related to municipal sewage treatment

plant:

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

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

Operational conditions: Indoor use.

Product Characteristics:

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use:

Emission Days (days/year): 225

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

9300

Continuous release.

Indoor, industrial setting

7 36x10-4

Not applicable.

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 on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to wastewater.

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 21500

Frequency and duration of use: Continuous release.

225 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor:

Other operational conditions of use affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to

1000 Indoor, industrial setting

7.36x10-4

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

Release fraction to wastewater from process (initial release 5.00x10-5 prior to RMM):

Technical conditions and measures at process level (source) to Not applicable. prevent release:

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

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

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 (%):

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

=>37 4

wastewater

Conditions and measures related to municipal sewage treatment

plant:

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

Section 3: Exposure estimation

Section 3.1Workers Exposure esti Contributing exposure scenario c		0: Use in closed process, no lik	relihood 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, Not applicable. Not applicable. Not applicable. Combined

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

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

has been derived.

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

has been derived

Since the substance is not classified for

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

Short term exposure, Systemic,

Not applicable Not applicable.

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

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

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

acute effects and therefore, no acute DNEL

has been derived.

0.12 Short term exposure, Local,

Inhalable

Not applicable.

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

exposure estimates for other PROC are below this value

Section 3.1Workers Exposure estimation

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

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

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

Tetraethylenepentamine, TEPA

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

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15 Substance supplied to that use in form of: As such

Sector of end use: SU03

Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, 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 3.1Workers Exposure estim Contributing exposure scenario con		Jse in closed batch process (synt	hesis or formulation)
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,	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 3.1Workers Exposure estim	ation		
Contributing exposure scenario con exposure arises		lse in batch and other process (sy	ynthesis) where opportunity for
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	highest exposure level is given since the exposure estimates for other PROC are
	Not applicable.	0.30 Not applicable.	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
Inhalable Long term exposure, Systemic,			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
Inhalable Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	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.
Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local,	Not applicable. Not applicable.	Not applicable. Not applicable.	highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL
Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable Short term exposure, Systemic,	Not applicable. Not applicable. Not applicable	Not applicable. Not applicable. Not applicable.	highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable Short term exposure, Systemic, Dermal Short term exposure, Systemic,	Not applicable. Not applicable. Not applicable Not applicable	Not applicable. Not applicable. Not applicable. Not applicable.	highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.

Short term exposure, Local, 0.62 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure scenario controlling worker exposure for 4: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) **Contributing scenarios** Route of exposure **Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.27 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. 0.30 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 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 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 **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.60 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 3.1Workers Exposure estimation** Contributing exposure scenario controlling worker exposure for 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.27 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. 0.37 The ECETOC TRA tool has been used to Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for

Tetraethylenepentamine, TEPA

Inhalable

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

has been derived.

Process Category: PROC01, PROC02, PROC03, PROC04, PROC05,
PROC08a, PROC08b, PROC09, PROC15
Substance supplied to that use in form of: As such

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

acute effects and therefore, no acute DNEL

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

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. 0.74 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure scenario controlling worker exposure for 6: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.14 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 0.548 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. 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 acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable. Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. 0.55 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure scenario controlling worker exposure for 7: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 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. 0.30 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Since the substance is not classified for Long term exposure, Local, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Tetraethylenepentamine, TEPA Identified use name: Use of ethylenamines in closed system with little

Not applicable.

Since the substance is not classified for

Short term exposure, Systemic,

Not applicable

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

Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for 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 0.62 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3.1Workers Exposure estimation

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

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

Section 3.2 Environment Exposure estimation

Not applicable.

Short term exposure, Local, Dermal Not applicable.

Short term exposure, Local,

Inhalable

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

Not applicable.

Not applicable.

	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

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

Not applicable.

Not applicable.

Sector of end use: SU03

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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 3.2 Environment Exposure estimation

Contributing exposure 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

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, PROC015
Substance supplied to that use in form of: As such
Sector of end use: SU03

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

PEC soil (local+regional) Local concentration Justification Agricultural soil averaged mg/kg 0 0.077 **EUSES** calculation dwt 0.077 Grassland averaged mg/kg dwt n **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 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 Environment Exposure estimation

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

Total release for regional **Justification** Release from point source (local exposure estimation) exposure estimation kg/day kg/day 0.269 Waste water 192 **EUSES** calculation **Surface water** Not evaluated. **EUSES** calculation 4.8 30.3 **EUSES** calculation air (direct + STP) Soil (direct releases only) Not evaluated. **FUSES** calculation **Value Justification EUSES** calculation Concentration in sewage (PECstp) 0.084 Concentration in sewage sludge 127 **EUSES** calculation mg/kg dwt **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. **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 3.25x10-11 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 6.43x10-11 0.077 **EUSES** calculation Groundwater mg/l 7.69x10-4 **EUSES** calculation Not evaluated. 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 PEC aquatic (local+regional) Local concentration Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available.

Health Not available.

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

EnvironmentNot applicable.HealthNot applicable.Additional good practicesNot applicable.

Tetraethylenepentamine, TEPA

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

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario 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

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 worker exposure

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

and articles (multistage and/or significant contact)

Product Characteristics: Liquid. Covers concentrations up to 2%

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

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

Not applicable.

Other operational conditions affecting worker 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:

dispersion and exposure:

Organisational measures to prevent/limit releases, 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.

Section 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to

vessels/large containers at non-dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 2%

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

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

Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Personal protection:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

removal efficiency of (%): 90%

Not applicable.

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

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

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

management supervision controls.

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

Industrial

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

Sector of end use: SU03

Section 2.1 Control of worker exposure

Contributing exposure 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

Not applicable.

Other operational conditions affecting worker 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.

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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

management supervision controls.

Section 2.2: Control of environmental exposure

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

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

Other operational conditions of use affecting environmental

exposure:

Indoor, industrial setting

Release fraction to air from process (initial release prior to

7.36x10-4

RMM):

Release fraction to soil from process (initial release prior to

1.00x10-4

Release fraction to wastewater from process (initial release

prior to RMM):

4.84x10-8

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%.

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

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

Prevent discharge of undissolved substance to or recover from onsite 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):

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

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

Other operational conditions of use affecting environmental

exposure:

Release fraction to air from process (initial release prior to Release fraction to soil from process (initial release prior to

1.00x10-4

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

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%.

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:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

7.36x10-4

=>37.4

Indoor. industrial setting

7.36x10-4

4.84x10-8

Conditions and measures related to municipal sewage treatment

plant:

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 9300 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 Average Local Daily Tonnage (kg/day): 10300

Frequency and duration of use: Continuous release.

225 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

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

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

to provide the required 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%.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to wastewater.

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 225

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission 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:

Conditions and measures related to municipal sewage treatment

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

Not applicable.

Indoor, industrial setting

7.36x10-4

5 00x10-5

Not applicable.

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.

=>37.4

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Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

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

Long term exposure, Systemic, **Dermal**

Not applicable.

0.005

Justification

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

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

Long term exposure, Systemic, 0.61 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the 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 Since the substance is not classified for Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL **Dermal** 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 Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, Not applicable. 1.22 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure 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. 0.005 estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.31 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 Not applicable. Long term exposure, Local, Dermal Not evaluated. Not applicable. Since the substance is not classified for Long term exposure, Local, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 0.61 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the

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

below this value

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

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

Contributing exposure 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.	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 3.1Workers Exposure estimation

Section 3.1Workers Exposure estimation

Contributing exposure 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, 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 Environment Exposure estimation

Contributing exposure 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

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

Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.21x10-3 0.077 **EUSES** calculation 0.077 Grassland averaged mg/kg dwt 2.39x10-3 **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 3.94x10-10 Annual average mg/m³ 4.82x10-15 **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 3.2 Environment Exposure estimation

Contributing exposure 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 3.2 Environment Exposure estimation

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

	(local exposure estimation) kg/day	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

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

Intermittent release. mg/l Not applicable Not applicable Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** 0.221 Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation 0.022 Marine water sediment mg/kg dwt Not evaluated. **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Justification Local concentration** PEC air (local+regional) During emission mg/m³ **EUSES** calculation Not evaluated. Annual average mg/m³ 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m2/d 0 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

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

Environment	Not available.
Health	Not available.

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

Environment Not applicable. Health Not applicable. **Additional good practices** Not applicable.

Tetraethylenepentamine, TEPA

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

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

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario 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

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 worker exposure

Contributing exposure 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.

Other operational conditions affecting worker 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. 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 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 1: Transfer of substance or preparation (charging/discharging) from/to

vessels/large containers at non-dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 0.5%

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

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

Not applicable.

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.

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

Industrial

Section 2.1 Control of worker exposure

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

vessels/large containers at dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 0.5%

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

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

Not applicable.

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable

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 2.1 Control of worker exposure

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

Not applicable. Not applicable.

from source towards the worker:

Organisational measures to prevent/limit releases,

Not applicable.

dispersion and exposure:

Personal protection:

Wear chemical-resistant 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 environmental exposure

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

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

Other operational conditions of use affecting environmental

exposure:

Indoor, industrial setting

Release fraction to air from process (initial release prior to

RMM):

7.36x10-4

Release fraction to soil from process (initial release prior to

1.00x10-4

4.84x10-8

Release fraction to wastewater from process (initial release

prior to RMM):

Not applicable.

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

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

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

Prevent discharge of undissolved substance to or recover from onsite 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):

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

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

Indoor. industrial setting

4.84x10-8

=>37.4

2000

wastewater.

Indoor, industrial setting

7.36x10-4

Not applicable.

Other operational conditions of use affecting environmental

exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

Release fraction to soil from process (initial release prior to 1.00x10-4

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission 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:

Conditions and measures related to municipal sewage treatment

plant:

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 9300 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 2320 Average Local Daily Tonnage (kg/day): 10300

Frequency and duration of use: Continuous release.

225 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Tetraethylenepentamine, TEPA

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

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

0.5% - Industrial

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

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

to provide the required 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%.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to wastewater.

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission 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:

Conditions and measures related to municipal sewage treatment

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

Not applicable.

4840

225

Indoor, industrial setting

7.36x10-4

5 00x10-5

Not applicable.

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

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

2000

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

Contributing exposure 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, Not applicable. Not applicable. Not applicable. **Dermal** Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Inhalable

Long term exposure, Systemic, Not applicable.

Combined

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

Inhalable

Not applicable.

Not applicable.

Not applicable. 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, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Section 3.1Workers Exposure estima			
Contributing exposure scenario con vessels/large containers at non-dedi		ranster of substance or preparati	on (charging/discharging) from/to
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
	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.	1.52	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 3.1Workers Exposure estimated Contributing exposure scenario convessels/large containers at dedicate	trolling worker exposure for 2: T	ransfer of substance or preparati	on (charging/discharging) from/to
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal	• • • • • • • • • • • • • • • • • • • •	Not applicable.	Not applicable.
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.

Section 3.1Workers Exposure estimation						
Contributing exposure scenario confilling line, including weighing)	Contributing exposure scenario controlling worker exposure for 3: Transfer of substance or preparation into small containers (dedicated					
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 Environment Exposure estimation

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

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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 3.2 Environment Exposure estimation

Contributing exposure 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
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

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

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

Annual average mg/m³ 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m2/d 0 Not evaluated. **EUSES** calculation

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

Section 3.2 Environment Exposure estimation

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

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

kg/day

Waste water 0.269 19.2 **EUSES** calculation Surface water Not evaluated. 4.8 **EUSES** calculation air (direct + STP) 30.3 **EUSES** calculation

Soil (direct releases only) Not evaluated. **EUSES** calculation

Justification Value EUSES calculation

Concentration in sewage (PECstp) 0.084

mg/kg dwt

Concentration in sewage sludge **EUSES** calculation 127

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 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. **FUSES** calculation

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

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available. Health Not available.

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

Environment Not applicable. Health Not applicable. Additional good practices Not applicable.

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 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

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 worker exposure

Contributing exposure 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).

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

Not applicable.

Other operational conditions affecting worker 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:

dispersion and exposure:

Organisational measures to prevent/limit releases,

Personal protection:

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

Section 2.2: Control of environmental exposure

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

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

Other operational conditions of use affecting environmental

exposure:

Indoor, industrial setting

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

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

4.84x10-8 prior to RMM):

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 (%):

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): 2000

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 4650 15500 Average Local Daily Tonnage (kg/day):

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

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

Other operational conditions of use affecting environmental

exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

Release fraction to soil from process (initial release prior to 1 00x10-4

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission 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:

Conditions and measures related to municipal sewage treatment

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

4.84x10-8

Indoor, industrial setting

Not applicable.

7.36x10-4

1 00x10-4

=>37.4

wastewater.

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

Prevent discharge of undissolved substance to or recover from onsite

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

Prevent discharge of undissolved substance to or recover from onsite

wastewater

2000

=>37.4

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

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

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Indoor, industrial setting Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air 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. Not applicable as there is no release to

to provide the required 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 applicable.

wastewater.

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 225

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

5 00x10-5

Not applicable.

Indoor, industrial setting

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

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

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

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

Conditions and measures related to municipal sewage treatment

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

Section 3: Exposure estimation

	trolling worker exposure for	0: Transfer of substance or pre	paration (charging/discharging) from/to
vessels/large containers at non-ded Route of exposure	icated facilities 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.	0.31	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the

Section 3.2 Environment Exposure estimation

Contributing exposure 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

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

exposure estimates for other PROC are

below this value

Sector of end use: SU22

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

Intermittent 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 3.2 Environment Exposure estimation

Contributing exposure 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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable as there is no release to wastewater.	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	

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

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

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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 Environment Exposure estimation

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

Environment	Not available.
Health	Not available.

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

Environment	Not applicable.
Health	Not applicable.
Additional good practices	Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition Multi-constituent substance
Product name Tetraethylenepentamine, TEPA

Section 1: Title

Short title of the exposure scenario 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

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 worker exposure

Contributing exposure 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.

Other operational conditions affecting worker 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.

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 specific activity

management supervision controls.

Section 2.2: Control of environmental exposure

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: Not applicable.

Other operational conditions of use affecting environmental Indoor. industrial setting

exposure:

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

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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 4.84x10-8

prior to RMM): Technical conditions and measures at process level (source) to Not applicable.

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

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

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

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

=>37.4

7.36x10-4

1.00x10-4

Conditions and measures related to municipal sewage treatment

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

2000

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

plant:

Regional use tonnage (tonnes/year): 18600 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 4650 15500 Average Local Daily Tonnage (kg/day):

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: Not applicable.

Other operational conditions of use affecting environmental

exposure:

7.36x10-4

Indoor, industrial setting

Release fraction to air from process (initial release prior to

1 00x10-4

Release fraction to soil from process (initial release prior to

RMM):

4.84x10-8

Release fraction to wastewater from process (initial release

prior to RMM):

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

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

(%):

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

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

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

=>37.4

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

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

Prevent discharge of undissolved substance to or recover from onsite wastewater

2000

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use:

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

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Indoor, industrial setting Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

9300

Continuous release.

7.36x10-4

Not applicable.

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 on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to wastewater.

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 225

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use affecting environmental

exposure:

7.36x10-4

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):

5 00x10-5

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

Process Category: PROC08a

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

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

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

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewate

Conditions and measures related to municipal sewage treatment

plant:

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

Section 3: Exposure estimation

Section 3.1Workers Exposure estim		0: Transfer of substance or pro	paration (charging/discharging) from/to
vessels/large containers at non-ded		v. Transier of Substance of pre	paration (charging/discharging) notifito
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.001	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.52	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

Section 3.2 Environment Exposure estimation

Contributing exposure 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

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

below this value

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

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Intermittent 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 3.2 Environment Exposure estimation

Contributing exposure 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 3.2 Environment Exposure estimation

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

Release from point source Total release for regional **Justification** (local exposure estimation) exposure estimation kg/day kg/day Waste water 19.2 **EUSES** calculation Surface water Not evaluated. 4.8 **EUSES** calculation 30.3 air (direct + STP) **EUSES** calculation Soil (direct releases only) Not evaluated. **EUSES** calculation Value **Justification**

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

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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 Environment Exposure estimation

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

Environment	Not available.
Health	Not available.

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

Environment	Not applicable.
Health	Not applicable.
Additional good practices	Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario Identified use name: 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 Identified use name: Use of ethylenamines in open processes with high exposure potential and

List of use descriptors 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 worker exposure

Contributing exposure 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 percentage substance in the product up to 25%.

Not applicable. Amounts used:

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.

Indoor. industrial setting Other operational conditions affecting worker 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

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

management supervision controls.

removal efficiency of (%): 90%

Section 2.1 Control of worker exposure

Contributing exposure 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 percentage substance in the product up to 25%.

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 operational conditions affecting worker exposure: Indoor, industrial setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

removal efficiency of (%): 90%

Not applicable.

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

management supervision controls.

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

Industrial

Section 2.1 Control of worker exposure

Contributing exposure 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: Do not use for more than 1 hours

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

Not applicable.

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Personal protection:

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

removal efficiency of (%): 90%

Not applicable.

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

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

management supervision controls.

Section 2.1 Control of worker exposure

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

filling line, including weighing)

Product Characteristics: Liquid. Covers percentage substance in the product up to 25%.

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 operational conditions affecting worker 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:

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 environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

7.36x10-4

Not applicable.

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: 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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use affecting environmental None

Release fraction to air from process (initial release prior to

RMM):

exposure:

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

7.36x10-4

7 36x10-4

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

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

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

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

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

Not applicable.

Technical on-site conditions and measures to reduce or limit

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

discharges, air emissions and releases to soil:

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

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

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

exposure:

5.00x10-4

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

Release fraction to soil from process (initial release prior to

1.00x10-2

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

5.00x10-3

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

(%):

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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):

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

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

Local marine water dilution factor: Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

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

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

1000

None.

7.36x10-4

1.00x10-3

7 36x10-4

1 00x10-3

Not applicable.

0.01

Not applicable.

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

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

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

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Identified use name: 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

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

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

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

Sector of end use: SU03

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

Tetraethylenepentamine, TEPA

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

Release fraction to air from process (initial release prior to

RMM):

exposure:

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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

7.36x10-4

7.36x10-4

1.00x10-3

Not applicable.

Not applicable.

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 2114

Frequency and duration of use: Continuous release

Emission Days (days/year):

Environmental factors not influenced by risk management:

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

exposure:

Release fraction to air from process (initial release prior to

RMM):

RMM):

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at 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) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

220

None.

7.36x10-04

Not applicable.

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%.

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

Dose/Concentration Route of exposure **Contributing scenarios 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, Not applicable. 0.3656

Inhalable

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

below this value

Long term exposure, Systemic, Not evaluated. 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 25% - Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: In a mixture Sector of end use: SU03

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

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

acute effects and therefore, no acute DNEL

has been derived.

0.73115 Short term exposure, Local, Not applicable. Inhalable

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

Section 3.1Workers Exposure estimation

Contributing exposure 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.

0.0685714

estimate workplace exposures unless otherwise indicated. 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 Not applicable.

Not applicable.

Long term exposure, Systemic, Combined

Long term exposure, Local, Dermal Not applicable.

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 acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for

Short term exposure, Systemic,

Short term exposure, Systemic,

Inhalable

Dermal

Not applicable

Not applicable.

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

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

Short term exposure, Systemic,

Combined

Not applicable

Not applicable.

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

has been derived.

Short term exposure, Local, Dermal Not applicable

Not applicable.

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

has been derived

Short term exposure, Local,

Inhalable

Dermal

Not applicable.

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 3.1Workers Exposure estimation

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

Route of exposure Long term exposure, Systemic, **Contributing scenarios** Not applicable.

Dose/Concentration 0.034286

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% - Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: In a mixture Sector of end use: SU03

Long term exposure, Systemic, 0.548325 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not evaluated. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL **Dermal** 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 Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable 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. 1.096725 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure 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** The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.0685714 Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.365575 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 evaluated. Not applicable. Not applicable. Combined Not applicable. Long term exposure, Local, Dermal Not applicable. Not applicable. Long term exposure, Local, Since the substance is not classified for Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 0.73115 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the

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

below this value

exposure estimates for other PROC are

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

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

Release from point source

Total release for regional

	(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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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: 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

Justification

During emission mg/m³ 0 Not evaluated. **EUSES** calculation Annual average mg/m³ 3.94x10-10 0 **EUSES** calculation Annual deposition mg/m2/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) Justification Not applicable. Micro-organism mg/l Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Release from point source

Not applicable.

Total release for regional

Not applicable.

(local exposure estimation) kg/day	exposure estimation kg/day	Justinication
0.388	19.2	EUSES calculation
Not evaluated.	4.8	EUSES calculation
0	30.3	EUSES calculation
Not evaluated.	0	Not applicable.
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 exposure estimation) kg/day 0.388 Not evaluated. 0 Not evaluated. Value 0.121 183 Local concentration 1.20x10-4 1.92x10-4 Not applicable. Local concentration Not evaluated.	kg/day 0.388 19.2 Not evaluated. 4.8 0 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 2.36x10-4 Not applicable. Not applicable. Local concentration PEC sediment (local+regional) Not evaluated. 0.282

Tetraethylenepentamine, TEPA

Micro-organism 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 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

Not applicable.

Justification

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 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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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

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

Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)) Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10-6	6.52x10-6	EUSES calculation
Annual deposition mg/m2/d	1.38x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	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

Justification Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. mg/l Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. PEC aquatic (local+regional) **Justification Local concentration** Fresh water mg/l 0 4.37x10-4 **EUSES** calculation Marine water mg/l n 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 dwt Grassland averaged mg/kg dwt 1.53x10-4 0.077 **EUSES** calculation 7.70x10-4 Groundwater mg/l Not evaluated. **EUSES** calculation PEC air (local+regional) **Justification Local concentration** Not evaluated. During emission mg/m³ 5.11x10-6 **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) **Local concentration Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 25% - Industrial Process Category: PROC05, PROC08a, PROC08b, PROC09 Substance supplied to that use in form of: In a mixture Sector of end use: SU03

Section 4: Guidance to check compliance with the exposure scenario

Environment	Not available.
Health	Not available.

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

Environment	Not applicable.
Health	Not applicable.
Additional good practices	Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario Identified use name: 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

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 worker exposure

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

and articles (multistage and/or significant contact)

Product Characteristics: Liquid. Covers concentrations up to 15%

Not applicable. Amounts used:

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

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

Not applicable.

Indoor. industrial setting Other operational conditions affecting worker 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

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

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

removal efficiency of (%): 90%

Section 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 1: Calendering operations

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

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

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

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

Not applicable.

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

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

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

Section 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 2: Industrial spraying

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

Section 2.1 Control of worker exposure

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

vessels/large containers at non-dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

Frequency and duration of use: Exposure duration per day: 1-4 hours

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

Not applicable.

Other operational conditions affecting worker 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:

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 2.1 Control of worker exposure

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

vessels/large containers at dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release: Technical conditions and measures to control dispersion Not applicable.

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 2.1 Control of worker exposure

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

filling line, including weighing)

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable

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

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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.

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

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

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

management supervision controls.

Section 2.1 Control of worker exposure

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

Product Characteristics: Liquid. Covers concentrations up to 15%

Amounts used: Not applicable

Frequency and duration of use: Exposure duration per day: 1-4 hours

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

Not applicable.

Not applicable.

Other operational conditions affecting worker 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:

dispersion and exposure:

Organisational measures to prevent/limit releases,

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

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

management supervision controls.

removal efficiency of (%): 90%

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

Section 2.1 Control of worker exposure

Contributing exposure 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:

Human factors not influenced by risk management:

Covers daily exposures up to 8 hours (unless stated differently). Default breathing volume Light work: 10 m³/d Default Body weight: Workers: 70 kg

Other operational conditions affecting worker exposure:

Indoor, industrial setting Technical conditions and measures at process level Not applicable.

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

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 Personal protection:

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

management supervision controls.

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to Not applicable.

7.36.10-4

prevent release:

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

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

Tetraethylenepentamine, TEPA

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

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 (%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

7.36.10-4

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

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

7.36.10-4

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

02/233

Release fraction to soil from process (initial release prior to

Release fraction to wastewater from process (initial release

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.

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

(%):

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Not applicable.

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None Other operational conditions of use 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):

5.00.10-3 Not applicable.

5 00 10-4

1.00.10-2

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

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

plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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):

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,

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

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

PROC09, PROC13, PROC14 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03

Frequency and duration of use: Continuous release. 220 Emission Days (days/year): Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 Other operational conditions of use affecting environmental None 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):

prior to RMM): Technical conditions and measures at process level (source) to

Release fraction to wastewater from process (initial release

1.00.10-3

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%.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use affecting environmental None

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):

1.00.10-3

Release fraction to wastewater from process (initial release

prior to RMM):

0.01

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - 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 exposure scenario controlling environmental exposure for 6: Lube oil use Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable. Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36.10-4 RMM): Release fraction to soil from process (initial release prior to 1 00 10-3 1.00.10-3 Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable. prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. (%): Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 7: Processing aid Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable. Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 Other operational conditions of use 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 RMM): Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to

Not applicable.

Tetraethylenepentamine, TEPA

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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 15% - Industrial Process Category: PROC05, PROC06, PROC07, PROC08a, PROC08b,

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

PROC09, PROC13, PROC14 Substance supplied to that use in form of: In a mixture

Sector of end use: SU03

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None.

Other operational conditions of use 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):

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.

7.36E-04

Not applicable.

discharges, air emissions and releases to soil:

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

Contributing scenarios Route of exposure **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

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

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.

Combined

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.

106/233

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

Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL Dermal has been derived. Not applicable. Since the substance is not classified for Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 0.914 Inhalable estimate workplace exposures unless

Section 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 1: Calendering operations

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

Long term exposure, Systemic,

Dermal

Not applicable.

0.0822

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

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

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.457

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

below this value Not applicable.

Long term exposure, Systemic,

Combined

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

Inhalable

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**

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, Systemic, Inhalable

Short term exposure, Systemic,

Not applicable

Not applicable

Not applicable.

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

has been derived.

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.

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 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 2: Industrial spraying

Not applicable.

Route of exposure Long term exposure, Systemic,

Dermal

Contributing scenarios

Dose/Concentration

0.1286

Justification

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

Tetraethylenepentamine, TEPA

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

Long term exposure, Systemic, 0.457 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not evaluated. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL **Dermal** has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived 0.914 Short term exposure, Local, Not applicable. The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure scenario controlling worker exposure for 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Route of exposure **Contributing scenarios Dose/Concentration** Justification The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. 0.0411 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.548 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 Not applicable. Long term exposure, Local, Dermal Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable **Dermal** acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived 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. 1.097 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

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

below this value

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b,

ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

exposure estimates for other PROC are

Section 3.1Workers Exposure estimated Contributing exposure scenario convessels/large containers at dedicate	trolling worker exposure for	4: Transfer of substance or pre	paration (charging/discharging) from/to
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.
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 3.1Workers Exposure estimates Contributing exposure scenario con filling line, including weighing)		5: Transfer of substance or pre	paration into small containers (dedicated
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.

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

estimate workplace 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 3.1Workers Exposure estimation** Contributing exposure scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, Not applicable. 0.0411 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 0.548 Long term exposure, Systemic, Not applicable. The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not evaluated. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not applicable. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.097 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 3.1Workers Exposure estimation** Contributing exposure scenario controlling worker exposure for 7: Production of preparations* or articles by tabletting, compression, extrusion, pelletisation Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, 0.0822 The ECETOC TRA tool has been used to Not applicable. **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. 0.457 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 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. **Dermal** Tetraethylenepentamine, TEPA Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use

Not applicable.

0.914

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

The ECETOC TRA tool has been used to

has been derived.

of preparations containing EA up to 15% - Industrial

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

Subsequent service life relevant for that use: No.

PROC09, PROC13, PROC14

Sector of end use: SU03

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

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

Short term exposure, Local, Dermal Not applicable

Not applicable.

Short term exposure, Local,

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

has been derived.

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

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Justification Release from point source Total release for regional exposure estimation kg/day (local exposure estimation) kg/day Waste water 0 19.2 **EUSES** calculation **EUSES** calculation **Surface water** Not evaluated. 48 30.3 EUSES calculation air (direct + STP) Soil (direct releases only) Not evaluated. Not applicable. Justification Value **EUSES** calculation Concentration in sewage (PECstp) Not applicable as there is no release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation release to wastewater. mg/kg dwt Local concentration PEC aquatic (local+regional) **Justification** Fresh water mg/l 4 37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. 0.221 **EUSES** calculation 0.022 Marine water sediment mg/kg dwt Not evaluated **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg **EUSES** calculation Grassland averaged mg/kg dwt n 0.077 **EUSES** calculation Groundwater mg/l **EUSES** calculation Not evaluated 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. **EUSES** calculation **Justification** Local concentration PEC aquatic (local+regional) Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

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

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

Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation release to wastewater. mg/kg dwt **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 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. **EUSES** calculation 0.221 Marine water sediment mg/kg dwt 0.022 **EUSES** calculation Not evaluated. PEC soil (local+regional) **Local concentration Justification** Agricultural soil averaged mg/kg **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation 0 Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m³ 0 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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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.

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Total release for regional

Release from point source

	(local exposure estimation) kg/day	exposure estimation kg/day	oustinoution
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	Not applicable.
	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

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

Justification

Sector of end use: SU03

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	0.121	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	183	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	1.20x10-4	5.58x10-4	EUSES calculation
Marine water mg/l	1.92x10-4	2.36x10-4	EUSES calculation
Intermittent release. mg/l	Not applicable.	Not applicable.	Not applicable.
	Local concentration	PEC sediment (local+regional)	Justification
Fresh water sediment mg/kg dwt	Not evaluated.	0.282	EUSES calculation
Marine water sediment mg/kg dwt	Not evaluated.	0.119	EUSES calculation
	Local concentration	PEC soil (local+regional)	Justification
Agricultural soil averaged mg/kg dwt	1.64x10-4	0.077	EUSES calculation
Grassland averaged mg/kg dwt	3.24x10-4	0.077	EUSES calculation
Groundwater mg/l	Not evaluated.	7.70x10-4	EUSES calculation
	Local concentration	PEC air (local+regional)	Justification
During emission mg/m³	7.93x10-6	Not evaluated.	EUSES calculation
Annual average mg/m³	6.52x10-6	6.52x10-6	EUSES calculation
Annual deposition mg/m2/d	1.38x10-5	Not evaluated.	EUSES calculation
	Local concentration	PEC aquatic (local+regional)	Justification
Micro-organism mg/l	Not applicable.	Not applicable.	Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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

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

0.023 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.22x10-5 **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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	

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

PEC aquatic (local+regional) **Justification** Local concentration 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 PEC soil (local+regional) **Local concentration Justification** 0.077 Agricultural soil averaged mg/kg 0 **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 **EUSES** calculation Not evaluated. **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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 Identified use name: 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

List of use descriptors Identified use name: Use of ethylenamines in open processes with high exposure potential and

> evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13,

PROC14, PROC19

Substance supplied to that use in form of: In a mixture Sector of end use: SU03, SU22 Subsequent service life relevant for that use: No.

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

Section 2: Operational conditions and risk management measures

Section 2.1 Control of worker exposure

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

and articles (multistage and/or significant contact)

Product Characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable.

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

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

Not applicable.

Not applicable.

Other operational conditions affecting worker exposure: Indoor, industrial setting

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,

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 2.1 Control of worker exposure

Contributing exposure 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

Not applicable.

Other operational conditions affecting worker exposure: Indoor, industrial setting

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

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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 2.1 Control of worker exposure

Contributing exposure 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

Not applicable.

Other operational conditions affecting worker exposure: Indoor. industrial setting

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion Us

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 auponision controls

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker exposure: Indoor. industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

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 worker exposure

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

Product Characteristics: Liquid. Covers concentrations up to 2%

Amounts used: Not applicable

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

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

Not applicable.

Other operational conditions affecting worker exposure: Indoor, industrial 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:

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.

Section 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker 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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure:

Indoor, industrial setting

Technical conditions and measures at process level

Not applicable.

(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 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

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

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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

Indoor, industrial setting Other operational conditions affecting worker exposure: Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

Section 2.2: Control of environmental exposure

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

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Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 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 exposure scenario controlling environmental exposure for 1: Use as an epoxy curing agent Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36.10-4 RMM): Release fraction to soil from process (initial release prior to Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable. prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 2: Epoxy curing agent in paint Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable. Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 Other operational conditions of use 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 RMM):

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

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

Technical on-site 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.

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: 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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use 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 1.00.10-2

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

(%):

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use 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):

1.00.10-3

7.36.10-4

5.00.10-3

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

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

Subsequent service life relevant 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 wastewater from process (initial release prior to RMM):

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

Not applicable.

Technical on-site conditions and measures to reduce or limit

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

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

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

Treat on-site wastewater (prior to receiving water discharge) =>37.4

(%):

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

Organisational measures to prevent/limit release from site:

plant:

Frequency and duration of use: Continuous release.

300

1000

None

7.36.10-4

1.00.10-3

0.01

Not applicable.

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

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

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

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

1000 Local marine water dilution factor: Other operational conditions of use affecting environmental None. 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 1.00.10-3 1.00.10-3 Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable. prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 7: Processing aid Operational conditions: Indoor/Outdoor use. Product Characteristics: Not applicable. Concentration of substance in mixture or article: Amounts used: Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364 Frequency and duration of use: Continuous release. Emission Days (days/year): 220

7.36.10-4

Not applicable.

Environmental factors not influenced by risk management: Local marine water dilution factor: 1000

None. Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

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

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

7 36F-04

Not applicable.

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

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

Long term exposure, Systemic, Not applicable.

Inhalable

0.61

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

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

below this value

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

Combined

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

Long term exposure, Local,

Inhalable

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**

Inhalable

Not applicable.

Not applicable.

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

has been derived.

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

has been derived.

Tetraethylenepentamine, TEPA

Short term exposure, Systemic,

Identified use name: 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 has been derived. Since the substance is not classified for Short term exposure, Local, Dermal Not applicable Not applicable. acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.22 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure 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. 0.09 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.61 Long term exposure, Systemic, Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined Long term exposure, Local, Dermal Not evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for Inhalable acute effects and therefore, no acute DNEL has been derived. 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. 1.22 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 3.1Workers Exposure estimation** Contributing exposure 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. 0.09 estimate workplace exposures unless Dermal otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value 0.61 The ECETOC TRA tool has been used to Long term exposure, Systemic, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable. Not applicable. Not applicable. Combined 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

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

Inhalable

Short term exposure, Local,

Not applicable.

1.22

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

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

below this value

Section 3.1Workers Exposure estimation

Contributing exposure 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** 0.05

Dermal

Long term exposure, Systemic,

Not applicable.

The ECETOC TRA tool has been used to

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

below this value

Long term exposure, Systemic,

Inhalable

Not applicable.

0.61

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

below this value Not applicable.

Not applicable.

Long term exposure, Systemic,

Long term exposure, Local, Dermal Not evaluated.

Long term exposure, Local,

Inhalable

Not applicable

Not applicable

Not applicable.

Not applicable.

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

has been derived. Since the substance is not classified for

Dermal Short term exposure, Systemic,

Short term exposure, Systemic,

Inhalable

Short term exposure, Systemic,

Combined

Not applicable

Not applicable.

Not applicable.

Not applicable.

Not applicable.

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

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.

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 3.1Workers Exposure estimation

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

Route of exposure

Long term exposure, Systemic, Dermal

Contributing scenarios Not applicable.

0.05

Dose/Concentration

Justification

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

below this value

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19 Substance supplied to that use in form of: In a mixture Sector of end use: SU03. SU22 Subsequent service life relevant for that use: No.

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

Long term exposure, Systemic, 0.61 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the 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 evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable Combined acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.22 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure scenario controlling worker exposure for 5: Roller application or brushing Route of exposure **Contributing scenarios Dose/Concentration Justification** The ECETOC TRA tool has been used to Long term exposure, Systemic, 0.09 Not applicable. estimate workplace exposures unless Dermal otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.61 Long term exposure, Systemic, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Not applicable. Not applicable. Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Not evaluated. Not applicable. Not applicable. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for 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. 1.22 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the

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.

below this value

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

Section 3.1Workers Exposure estimates Contributing exposure scenario con		Non industrial spraying	
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
Section 3.1Workers Exposure estimates			
Contributing exposure scenario con	trolling worker exposure for 7:	Treatment of articles by dipping a	nd pouring
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.

Not applicable.

Short term exposure, Local,

Inhalable

Not applicable.

Not applicable.

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.

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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

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

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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	

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 concentration PEC aquatic (local+regional) **Justification** 0 4.37x10-4 **EUSES** calculation Fresh water mg/l 0 **EUSES** calculation Marine water mg/l 4 34x10-5 Intermittent release. mg/l Not applicable. Not applicable. Not applicable. PEC sediment (local+regional) **Justification Local concentration** Not evaluated. Fresh water sediment mg/kg dwt 0.221 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation dwt 0.077 Grassland averaged mg/kg dwt 0 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 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 PEC aquatic (local+regional) **Local concentration Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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.

ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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

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 concentration PEC air (local+regional) Justification During emission mg/m³ 7.93x10-6 Not evaluated. **EUSES** calculation Annual average mg/m³ 6.52x10-6 6 52x10-6 **EUSES** calculation Annual deposition mg/m2/d 1.38x10-5 Not evaluated. **EUSES** calculation Local concentration PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Release from point source Total release for regional **Justification** (local exposure estimation) exposure estimation kg/day kg/day Waste water 3.94x10-3 **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. Not applicable. **Justification** Value Concentration in sewage (PECstp) 1.23x10-3 **EUSES** calculation **EUSES** calculation Concentration in sewage sludge 1 86 mg/kg dwt **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. PEC sediment (local+regional) **Local concentration 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** Justification PEC soil (local+regional) 1.22x10-5 0.077 **EUSES** calculation Agricultural soil averaged mg/kg dwt Grassland averaged mg/kg dwt 2 42x10-5 0.077 **FUSES** calculation Groundwater mg/l Not evaluated. 7 69x10-4 **FUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ 8.06x10-7 Not evaluated. **EUSES** calculation 4.86x10-7 **EUSES** calculation Annual average mg/m³ 4 86x10-7 Annual deposition mg/m2/d Not evaluated. 1 03x10-6 **EUSES** calculation

PEC aquatic (local+regional)

Total release for regional

Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Release from point source

Local concentration

Not applicable.

(local exposure estimation) exposure estimation kg/day kg/day Waste water 192 **EUSES** calculation Not evaluated. **EUSES** calculation Surface water 48 30.3 **EUSES** calculation 0.018 air (direct + STP) Soil (direct releases only) Not evaluated. n Not applicable. **Value Justification** Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. Concentration in sewage sludge **EUSES** calculation Not applicable as there is no release to wastewater. mg/kg dwt PEC aquatic (local+regional) **Justification Local concentration** Fresh water mg/l 0 4.37x10-4 **EUSES** calculation **EUSES** calculation Marine water mg/l 4.34x10-5 Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification**

Tetraethylenepentamine, TEPA

Micro-organism 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 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

Justification

Justification

Not applicable.

Fresh water sediment mg/kg dwt Not evaluated. 0.221 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 7.73x10-5 0.077 **EUSES** calculation dwt 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 **FUSES** 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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 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% - 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)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario Identified use name: 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

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 worker exposure

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

and articles (multistage and/or significant contact)

Product Characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable

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

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

Other operational conditions affecting worker 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:

dispersion and exposure:

Organisational measures to prevent/limit releases,

Personal protection:

Not applicable.

Not applicable.

Not applicable.

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

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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

Not applicable.

Indoor, industrial setting Other operational conditions affecting worker 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:

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 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

Industrial

Organisational measures to prevent/limit releases,

dispersion and exposure:

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

Wear chemical-resistant 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 2.1 Control of worker exposure

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

Not applicable.

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 operational conditions affecting worker exposure: Indoor. industrial setting

Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

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 2.1 Control of worker exposure

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

vessels/large containers at dedicated facilities

Product Characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor. industrial setting

Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor. industrial setting

Indoor, industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

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 0.5% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC14

Substance supplied to that use in form of: In a mixture Sector of end use: SU03. SU22

Subsequent service life relevant for that use: No.

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

Section 2.1 Control of worker exposure

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

Product Characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Indoor, industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

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 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker 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 2.1 Control of worker exposure

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

Product Characteristics: Liquid. Covers concentrations up to 0.5%

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor. industrial setting

Indoor. industrial setting and professional setting

Indoor. professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor. industrial setting

Indoor. industrial setting and professional setting

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable

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

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Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Not applicable.

Personal protection:

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

management supervision controls.

Section 2.1 Control of worker exposure

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

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

Indoor. industrial setting Other operational conditions affecting worker exposure:

Indoor, industrial setting and professional setting

Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

management supervision controls.

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

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

Not applicable.

7 36 10-4

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

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Conditions and measures related to municipal sewage treatment

plant:

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Industrial Process Category: PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13, PROC14, PROC19

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

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

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 exposure scenario controlling environmental exposure for 1: Use as an epoxy curing agent Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure: Release fraction to air from process (initial release prior to 7.36.10-4 RMM): Release fraction to soil from process (initial release prior to Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable. prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 2: Epoxy curing agent in paint Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable. Concentration of substance in mixture or article: Amounts used: 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): 2114 Frequency and duration of use: Continuous release. Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 Other operational conditions of use 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 RMM): Release fraction to wastewater from process (initial release

prior to RMM):

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

Technical on-site 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.

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: 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

1/10/222

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 er operational conditions of use affecting environmental None.

Other operational conditions of use affecting environmental 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

(%):

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use 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):

1.00.10-3

7.36.10-4

1.00.10-2

5.00.10-3

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

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

Subsequent service life relevant 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 wastewater from process (initial release prior to RMM):

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

Not applicable.

7.36.10-4

1.00.10-3

Not applicable.

0.01

Technical on-site conditions and measures to reduce or limit

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

discharges, air emissions and releases to soil:

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

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

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

(%):

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

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

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

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

Sector of end use: SU03. SU22

1000 Local marine water dilution factor: Other operational conditions of use affecting environmental None. 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 1.00.10-3 1.00.10-3 Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable. prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. Treat on-site wastewater (prior to receiving water discharge) =>37.4 to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 7: Processing aid Operational conditions: Indoor/Outdoor use. Product Characteristics: Not applicable. Concentration of substance in mixture or article: Amounts used: Regional use tonnage (tonnes/year): 5580 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 1400 Average Local Daily Tonnage (kg/day): 6364 Frequency and duration of use: Continuous release. Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None.

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

to provide the required 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 applicable.

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 on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use affecting environmental exposure: 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):

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

Technical on-site conditions and measures to reduce or limit

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

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

0

Not applicable.

7 36F-04

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

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

on emission controls are not applicable as there is no direct release to son

No constant and a standard and a social ad

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

Not applicable.

Route of 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.

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Local,

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 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

Not applicable.

Section 3.1Workers Exposure estimation				
Contributing exposure scenario controlling worker exposure for 1: Industrial spraying				
Route of exposure	Contributing scenarios	Dose/Concentration	Justification	
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.	
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.	
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.	
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Local, Dermal	• •	Not applicable.	Not applicable.	
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Section 3.1Workers Exposure estim			,, , ,, , , , , , , , , , , , , , , , ,	
Contributing exposure scenario con vessels/large containers at non-ded	icated facilities			
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.	Not applicable.	
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Section 3.1Workers Exposure estim Contributing exposure scenario con		ranefor of substance or properti	on (charging/discharging) from/to	
vessels/large containers at dedicate		ransier of substance of preparati	on (charging/discharging) from/to	
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.	
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.	
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.	

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.

•	Section 3.1Workers Exposure estimation				
Contributing exposure scenario confilling line, including weighing)			•		
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.		
	• • • • • • • • • • • • • • • • • • • •	Not applicable.	Not applicable.		
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.		
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.		
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.		
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.		
Short term exposure, Local, Dermal	• •	Not applicable.	Not applicable.		
Short term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.		
Section 3.1Workers Exposure estim					
Contributing exposure scenario con		•			
Route of exposure	Contributing scenarios	Dose/Concentration	Justification Not applicable.		
Long term exposure, Systemic, Dermal	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.		
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 3.1Workers Exposure estim		lon industrial amounts			
Contributing exposure scenario con			Local Constitution		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification The ECCTOC TRA tool has been used to		
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, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.		

Tetraethylenepentamine, TEPA

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

Short term exposure, Systemic, Not applicable. Since the substance is not classified for Not applicable Inhalable acute effects and therefore, no acute DNEL has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. 1.22 Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation**

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

Section 3.1Workers Exposure estimation

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

- , , penetisation

Inhalable

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

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

Section 3.1Workers Exposure estimation Contributing exposure scenario controlling worker exposure for 9: Hand-mixing with intimate contact and only PPE available				
Route of exposure	Contributing scenarios	Dose/Concentration	Justification	
Long term exposure, Systemic, Dermal	Not applicable.	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 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.	1.52	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 applicable.		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: 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

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

Section 3.2 Environment Exposure estimation

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

Release from point source Total release for regional **Justification** (local exposure estimation) exposure estimation kg/day kg/day Waste water 19.2 **EUSES** calculation Surface water Not evaluated. 4.8 **EUSES** calculation air (direct + STP) 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. Not applicable. **Justification Value** Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation release to wastewater. mg/kg dwt Local concentration PEC aquatic (local+regional) Justification Fresh water mg/l 4.37x10-4 **EUSES** calculation Marine water mg/l 4.34x10-5 **EUSES** calculation 0 Intermittent 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 applicable. **EUSES** calculation **Local concentration Justification** PEC soil (local+regional) Agricultural soil averaged mg/kg 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. **FUSES** calculation **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

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

Marine water sediment mg/kg dwt Not applicable. **EUSES** calculation PEC soil (local+regional) **Local concentration Justification** Agricultural soil averaged mg/kg **EUSES** calculation 0.077 Grassland averaged mg/kg dwt 0 **EUSES** calculation Groundwater mg/l 7.69x10-4 Not evaluated. **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 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 Environment Exposure estimation

Contributing exposure 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	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	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 applicable.		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 Environment Exposure estimation

Contributing exposure 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	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	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% - 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 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 applicable.		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 Environment Exposure estimation

Contributing exposure 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	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	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 applicable.		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.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 applicable.		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 Environment Exposure estimation

Contributing exposure 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	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 applicable.		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 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 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. **EUSES** calculation Local concentration PEC aquatic (local+regional) Justification Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

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

Justification Release from point source Total release for regional exposure estimation kg/day (local exposure estimation) kg/day Waste water **EUSES** calculation Surface water Not evaluated. 4.8 **EUSES** calculation air (direct + STP) 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. 0 Not applicable. **Justification Value** Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. Concentration in sewage sludge Not applicable as there is no **EUSES** calculation release to wastewater. mg/kg dwt **Local concentration** PEC aquatic (local+regional) Justification Fresh water mg/l 0 4.37x10-4 **EUSES** calculation Marine water mg/l n 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 **FUSES** calculation Marine water sediment mg/kg dwt Not applicable. **EUSES** calculation Justification Local concentration PEC soil (local+regional) 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 0 Not evaluated **EUSES** calculation Local concentration PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available.

Health Not available.

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

Environment Not applicable.

Health Not applicable.

Additional good practices Not applicable.

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.

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

Multi-constituent substance Tetraethylenepentamine, TEPA

Section 1: Title

Product definition

Product name

Short title of the exposure scenario Identified use name: 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 Identified use name: Use of ethylenamines in open processes with high exposure potential and

List of use descriptors

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 worker exposure

Contributing exposure 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%

Not applicable. Amounts used:

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

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. professional setting Other operational conditions affecting worker exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

dispersion and exposure:

Organisational measures to prevent/limit releases,

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor. professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

Professional

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 environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Continuous release. Frequency and duration of use:

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

Not applicable.

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

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

7.36x10-4

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

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) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Not applicable.

7.36x10-4

Technical conditions and measures at process level (source) to prevent release: Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

5.00x10-4

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

Release fraction to soil from process (initial release prior to 1.00x10-2 RMM):

Release fraction to wastewater from process (initial release 5.00x10-3 prior to RMM):

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

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

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

Treat air emission to provide a typical removal efficiency of

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

Not applicable.

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 5500

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None Other operational conditions of use 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 1.00x10-3

prior to RMM):

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

7.36x10-4

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) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

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

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

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

Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 None. Other operational conditions of use 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 0.01

prior to RMM):

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

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

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

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

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

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

4840

1.00x10-3

1.00x10-3

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%.

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

Contributing exposure scenario controlling environmental exposure for 7: Processing aid Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Not applicable.

7 36x10-4

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

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 25% Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 1274

Continuous release. Frequency and duration of use:

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use affecting environmental None.

Release fraction to air from process (initial release prior to

RMM):

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

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

0.01

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: 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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 3: Exposure estimation

Contributing exposure scenario con and articles (multistage and/or signi		0: Mixing or blending in batch p	processes for formulation of preparations*
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 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.	0.73115	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 3.1Workers Exposure estim Contributing exposure scenario con vessels/large containers at non-ded	trolling worker exposure for	1: Transfer of substance or pre	paration (charging/discharging) from/to
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

Not applicable.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

Long term exposure, Local,

Inhalable

Long term exposure, Systemic,

Long term exposure, Local, Dermal Not applicable.

Not evaluated.

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

below this value

Not applicable.

Not applicable.

has been derived.

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

Since the substance is not classified for

acute effects and therefore, no acute DNEL

Short term exposure, Systemic, 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, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL 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 0.91393 The ECETOC TRA tool has been used to Short term exposure, Local, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	

Tetraethylenepentamine, TEPA

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

61/233

Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. **Local concentration** PEC aquatic (local+regional) **Justification** Fresh water mg/l 4.37x10-4 **EUSES** calculation Marine water mg/l 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 PEC soil (local+regional) **Justification Local concentration** Agricultural soil averaged mg/kg 0 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 n Not evaluated. **EUSES** calculation 3.94x10-10 **EUSES** calculation Annual average mg/m³ 0 Annual deposition mg/m2/d **FUSES** calculation Not evaluated **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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.

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Total release for regional

Release from point source

	(local exposure estimation) kg/day	exposure estimation kg/day	
Waste water	0.115	19.2	EUSES calculation
Surface water	Not evaluated.	4.8	EUSES calculation
air (direct + STP)	0	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	Not applicable.
	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

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

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

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Release from point source Total release for regional **Justification** (local exposure estimation) exposure estimation kg/day kg/day 0.388 Waste water 192 **FUSES** calculation Surface water Not evaluated. 4.8 **EUSES** calculation air (direct + STP) 0.0285 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. Not applicable. **Justification** Value Concentration in sewage (PECstp) 0.121 **EUSES** calculation Concentration in sewage sludge **EUSES** calculation 183 mg/kg dwt Local concentration PEC aquatic (local+regional) **Justification** Fresh water mg/l 5.58x10-4 1.20x10-4 **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** 1.64x10-4 0.077 **EUSES** calculation Agricultural soil averaged mg/kg 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 EUSES calculation During emission mg/m³ 7 93x10-6 Not evaluated. Annual average mg/m³ 7 93x10-6 6 52x10-6 **EUSES** calculation Annual deposition mg/m2/d 1 38x10-5 **EUSES** calculation Not evaluated. **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

kg/dav

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Release from point source

(local exposure estimation)

	ngrady		
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	Not applicable.
	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

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

Justification

Total release for regional

exposure estimation kg/day

Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 1.22x10-5 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 2.42x10-5 **EUSES** calculation 7.69x10-4 Groundwater mg/l Not evaluated. **EUSES** calculation **Local concentration** PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. 8.06x10-7 **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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

Contributing exposure 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	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

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

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 0.024 **EUSES** calculation Not evaluated. PEC soil (local+regional) **Local concentration Justification** Agricultural soil averaged mg/kg 2.00x10-12 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 3.96x10-12 **EUSES** calculation 0.077 Groundwater mg/l 7.69x10-4 **EUSES** calculation Not evaluated. PEC air (local+regional) **Justification Local concentration** During emission mg/m³ Not evaluated. **EUSES** calculation 7.96x10-14 Annual average mg/m³ 3.94x10-10 **EUSES** calculation 7.96x10-14 Annual deposition mg/m2/d 1.69x10-13 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Justification Local concentration** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available.

Health Not available.

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

Environment Not applicable.

Health Not applicable.

Additional good practices Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario Identified use name: 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 Identified use name: Use of ethylenamines in open processes with high exposure potential and

List of use descriptors 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

Section 2.1 Control of worker exposure

Contributing exposure 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%

Not applicable. Amounts used:

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

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. professional setting Other operational conditions affecting worker exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

dispersion and exposure:

Personal protection:

Organisational measures to prevent/limit releases,

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

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

management supervision controls.

removal efficiency of (%): 90%

Section 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 1: Roller application or brushing

Liquid. Covers concentrations up to 15% **Product Characteristics:**

Amounts used: Not applicable.

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

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

Other operational conditions affecting worker exposure: Indoor, professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Not applicable.

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. Wear appropriate respiratory protection. with a

minimum efficacy of 95%

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

Professional

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection:

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

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Not applicable.

7.36x10-4

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

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

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Conditions and measures related to municipal sewage treatment

Organisational measures to prevent/limit release from site:

plant:

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release

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

220 Emission Days (days/year): **Environmental factors not influenced by risk management:** Local marine water dilution factor: 1000 Other operational conditions of use affecting environmental None exposure: Release fraction to air from process (initial release prior to 7.36x10-4 RMM): Release fraction to soil from process (initial release prior to RMM): Release fraction to wastewater from process (initial release prior to RMM): Technical conditions and measures at process level (source) to Not applicable prevent release: Technical on-site conditions and measures to reduce or limit Soil emission controls are not applicable as there is no direct release to soil. discharges, air emissions and releases to soil: Treat air emission to provide a typical removal efficiency of No air emission controls required; required removal efficiency is 0%. (%): Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment plant: Contributing exposure scenario controlling environmental exposure for 2: Epoxy curing agent in paint Operational conditions: Indoor/Outdoor use. Product Characteristics: Not applicable. Concentration of substance in mixture or article: Amounts used: 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 Frequency and duration of use: Continuous release Emission Days (days/year): 220 Environmental factors not influenced by risk management: Local marine water dilution factor: 1000 None Other operational conditions of use affecting environmental exposure: 7 36x10-4

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):

Technical conditions and measures at process level (source) to

prevent release:

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

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Conditions and measures related to municipal sewage treatment

plant:

Not applicable.

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

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

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

Contributing exposure scenario controlling environmental exposure for 3: Electroplating. Operational conditions: Indoor/Outdoor use. **Product Characteristics:** Not applicable Concentration of substance in mixture or article: Amounts used:

5.00x10-4

5.00x10-3

Not applicable.

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental exposure:

Release fraction to air from process (initial release prior to

RMM):

Release fraction to soil from process (initial release prior to 1.00x10-2

Release fraction to wastewater from process (initial release

prior to RMM):

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

Technical on-site conditions and measures to reduce or limit

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

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

Organisational measures to prevent/limit release from site:

plant:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Continuous release. Frequency and duration of use:

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site 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.

7.36x10-4

1.00x10-3

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to 7.36x10-4

RMM):

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

RMM):

Release fraction to wastewater from process (initial release

prior to RMM):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

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

(%):

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000
Other operational conditions of use affecting environmental None.

exposure:

Release fraction to air from process (initial release prior to

RMM):

o 7.36x10-4

0.01

Not applicable.

Release fraction to soil from process (initial release prior to

o 1.00x10-3

RMM):

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

prior to RMM):

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

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

Subsequent service life relevant for that use: No.
Environmental Release Category: ERC01, ERC02, ERC04, ERC05,
ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b,
ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

171/233

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

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Not applicable.

7.36x10-4

Not applicable.

Technical on-site conditions and measures to reduce or limit

Technical conditions and measures at process level (source) to

discharges, air emissions and releases to soil:

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

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%.

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

1860 Regional use tonnage (tonnes/year): 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 Average Local Daily Tonnage (kg/day): 1274

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

exposure:

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

Release fraction to air from process (initial release prior to RMM): 5.00x10-3

Release fraction to soil from process (initial release prior to

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

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

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

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

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

0.01

Not applicable.

Route of exposure **Contributing scenarios Dose/Concentration Justification** Long term exposure, Systemic, The ECETOC TRA tool has been used to Not applicable. 0.0411 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

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

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

Long term exposure, Systemic, Not applicable. 0.457 Inhalable

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

below this value

Not applicable.

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

Long term exposure, Local, Dermal Not applicable.

Long term exposure, Local,

Inhalable

Short term exposure, Systemic, Not applicable

Dermal

Short term exposure, Systemic,

Combined

Inhalable

Short term exposure, Systemic, Not applicable

Short term exposure, Local, Dermal Not applicable

Short term exposure, Local, Inhalable

Not applicable

Not applicable

Not applicable.

Not applicable. 0.914

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.

Since the substance is not classified for

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

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has been derived.

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

has been derived.

Since the substance is not classified for

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

The ECETOC TRA tool has been used to estimate workplace 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

Section 3.1Workers Exposure estim Contributing exposure scenario con		1: Roller application or brushir	ng
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 3.1Workers Exposure estim Contributing exposure scenario con		2: Non industrial spraying	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.214	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.121	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
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.
		Niet enelieels	Since the substance is not classified for
	Not applicable	Not applicable.	acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable Short term exposure, Systemic, Combined	Not applicable Not applicable	Not applicable.	acute effects and therefore, no acute DNEL

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 15% - Professional Process Category: PROC08a, PROC10, PROC11 Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Short term exposure, Local, Not applicable. 0.243 Inhalable

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

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

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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

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

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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	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

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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.

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

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

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

Total release for regional

Release from point source

	(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
	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	7.96x10-14	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: 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

79/233

During emission mg/m³ Not evaluated. 7.96x10-14 **EUSES** calculation Annual average mg/m³ 3.94x10-10 **EUSES** calculation 7.96x10-14 Annual deposition mg/m2/d 1.69x10-13 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Justification Local concentration** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

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

List of use descriptors

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 worker exposure

Contributing exposure 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%

Not applicable. Amounts used:

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 operational conditions affecting worker 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.

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

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.

removal efficiency of (%): 90%

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

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

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. 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 2% - Professional Process Category: PROC08a, PROC11 Substance supplied to that use in form of: In a mixture

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

Not applicable.

Contributing exposure scenario controlling environmental exposure for 1: Use as an epoxy curing agent Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

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

Not applicable.

7.36x10-4

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Operational conditions: Indoor/Outdoor use.

Concentration of substance in mixture or article:

Amounts used:

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

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: None

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Product Characteristics: Not applicable.

1860 Regional use tonnage (tonnes/year):

Frequency and duration of use: Continuous release.

1000

7.36x10-4

Not applicable.

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

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

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

5.00x10-4

1.00x10-2

5.00x10-3

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional Process Category: PROC08a, PROC11 Substance supplied to that use in form of: In a mixture

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

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

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

Not applicable.

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 (%):

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

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

1.00x10-3

7.36x10-4

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

(%):

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

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

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

exposure:

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

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):

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

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

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

7.36x10-4

1 00x10-3

0.01

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

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

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics:

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use:

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

4840

Continuous release.

None

7.36x10-4

1.00x10-3

1 00x10-3

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%.

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

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

Frequency and duration of use: Continuous release. 220

Emission Days (days/year): Environmental factors not influenced by risk management:

1000 Local marine water dilution factor:

Other operational conditions of use 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):

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

7 36x10-4

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

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 1274 Average Local Daily Tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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 0.01 prior to RMM):

Technical conditions and measures at process level (source) to

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

5.00x10-3

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

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

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

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

Route of exposure	icated facilities 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 DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3.1Workers Exposure estimate Contributing exposure scenario con		1: Non industrial spraying	
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
Long term exposure, Systemic,	Not applicable.	0.15	below this value The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the
Inhalable			highest exposure level is given since the exposure estimates for other PROC are below this value
	Not applicable.	Not applicable.	highest exposure level is given since the exposure estimates for other PROC are
Inhalable Long term exposure, Systemic,		Not applicable.	highest exposure level is given since the exposure estimates for other PROC are below this value
Inhalable Long term exposure, Systemic, Combined			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,	Not evaluated.	Not applicable.	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 DNEI
Inhalable Long term exposure, Systemic, Combined Long term exposure, Local, Dermal Long term exposure, Local, Inhalable Short term exposure, Systemic,	Not evaluated. Not applicable	Not applicable. Not applicable.	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 DNEI has been derived. Since the substance is not classified for acute effects and therefore, no acute DNEI

Identified use name: 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

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

Short term exposure, Local, Not applicable. Inhalable

0.30

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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

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

Fresh water sediment mg/kg dwt Not evaluated. 0.221 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) Justification Agricultural soil averaged mg/kg 0.077 **EUSES** calculation Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Groundwater mg/l Not evaluated. 7.69x10-4 **EUSES** calculation Local concentration PEC air (local+regional) **Justification** During emission mg/m³ Not evaluated. EUSES calculation Annual average mg/m³ **EUSES** calculation 3 94x10-10 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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Release from point source Total release for regional **Justification** (local exposure estimation) exposure estimation kg/day kg/day Waste water 0.388 192 **EUSES** calculation Not evaluated. **EUSES** calculation Surface water 4.8 air (direct + STP) 30.3 **EUSES** calculation Soil (direct releases only) Not evaluated. Not applicable. Value **Justification** Concentration in sewage (PECstp) 0.121 **EUSES** calculation 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 2% - Professional Process Category: PROC08a, PROC11
Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Concentration in sewage sludge **EUSES** calculation mg/kg dwt **Justification Local concentration** PEC aquatic (local+regional) 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 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 6 24x10-11 0.077 **EUSES** calculation Annual average mg/m³ 1 24x10-10 0.077 **EUSES** calculation Annual deposition mg/m2/d **EUSES** calculation Not evaluated 7 69x10-4 **Local concentration** PEC aquatic (local+regional) **Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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	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.

Total release for regional

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Release from point source

94x10-3 ot evaluated. 9x10-3 ot evaluated	19.2 4.8 30.3	EUSES calculation EUSES calculation
9x10-3		EUSES calculation
	30.3	
ot evaluated		EUSES calculation
ot oraidatoa.	0	Not applicable.
alue	Justification	
23x10-3	EUSES calculation	
86	EUSES calculation	
ocal concentration	PEC aquatic (local+regional)	Justification
22x10-6	4.38x10-4	EUSES calculation
22x10-6	4.46x10-5	EUSES calculation
ot applicable.	Not applicable.	Not applicable.
ocal concentration	PEC sediment (local+regional)	Justification
ot evaluated.	0.221	EUSES calculation
ot evaluated.	0.023	EUSES calculation
ocal concentration	PEC soil (local+regional)	Justification
22x10-5	0.077	EUSES calculation
42x10-5	0.077	EUSES calculation
ot evaluated.	7.69x10-4	EUSES calculation
ocal concentration	PEC air (local+regional)	Justification
	ot evaluated. alue 23x10-3 86 ccal concentration 22x10-6 22x10-6 ot applicable. ocal concentration ot evaluated. ot evaluated. ot evaluated. ocal concentration 22x10-5 42x10-5 ot evaluated.	ot evaluated. ot eva

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

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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 3.2 Environment Exposure estimation

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

Total release for regional

exposure estimation kg/day

Release from point source

(local exposure estimation)

EUSES calculation
EUSES calculation
EUSES calculation
Not applicable.
on
lculation
lculation
tic (local+regional) Justification
EUSES calculation
EUSES calculation
able. Not applicable.
ment (local+regional) Justification
EUSES calculation
EUSES calculation
1

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

Justification

Local concentration PEC soil (local+regional) Justification

Agricultural soil averaged mg/kg 2.00x10-12 0.077 EUSES calculation

Grassland averaged mg/kg dwt3.96x10-120.077EUSES calculationGroundwater mg/lNot evaluated.7.69x10-4EUSES calculation

Local concentration PEC air (local+regional) Justification

During emission mg/m³7.96x10-14Not evaluated.EUSES calculationAnnual average mg/m³7.96x10-143.94x10-10EUSES calculationAnnual deposition mg/m2/d1.69x10-13Not evaluated.EUSES calculationLocal concentrationPEC aquatic (local+regional)Justification

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

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available.
Health Not available.

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

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

List of use descriptors

evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional

Process Category: PROC08a, PROC11

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

Sector of end use: SU22

Subsequent service life relevant for that use: No.

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

Section 2: Operational conditions and risk management measures

Section 2.1 Control of worker exposure

Contributing exposure 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%

Not applicable. Amounts used:

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.

management supervision controls.

Other operational conditions affecting worker 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:

dispersion and exposure:

Personal protection:

Organisational measures to prevent/limit releases,

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, professional setting

Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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

Not applicable.

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

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

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

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

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% - Professional Process Category: PROC08a, PROC11

Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Contributing exposure scenario controlling environmental exposure for 0: Ashless dispersant

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

300 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

(%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

7.36x10-4

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

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

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

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

Not applicable.

7.36x10-4

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: 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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

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

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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): 2114

Frequency and duration of use:

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required.

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Continuous release.

7.36x10-4

Not applicable.

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

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

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Operational conditions: Indoor/Outdoor use.

Product Characteristics:

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

Not applicable.

5.00x10-4

1.00x10-2

5.00x10-3

Tetraethylenepentamine, TEPA

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11 Substance supplied to that use in form of: In a mixture

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Sector of end use: SU22

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

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

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

Not applicable.

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 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

Contributing exposure scenario controlling environmental exposure for 4: Metal working fluids

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

220 Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

7.36x10-4

1.00x10-3

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

(%):

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

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

Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment

plant:

Contributing exposure scenario controlling environmental exposure for 5: Corrosion inhibitor.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 300

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

exposure:

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

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 0.01 prior to RMM):

Technical conditions and measures at process level (source) to No prevent release:

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

Treat air emission to provide a typical removal efficiency of

(%):
Treat on-site wastewater (prior to receiving water discharge) =>37.4

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

Conditions and measures related to municipal sewage treatment plant:

Not applicable.

7.36x10-4

1.00x10-3

1 00x10-3

Not applicable.

7.36x10-4

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

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

Contributing exposure scenario controlling environmental exposure for 6: Lube oil use

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 220

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000

Other operational conditions of use affecting environmental exposure: 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):

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

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

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

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

Contributing exposure scenario controlling environmental exposure for 7: Processing aid

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable

Concentration of substance in mixture or article:

Amounts used:

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

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

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

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

Subsequent service life relevant 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): Environmental factors not influenced by risk management:

1000 Local marine water dilution factor:

Other operational conditions of use 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):

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

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

Treat air emission to provide a typical removal efficiency of

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

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

Not applicable.

7 36x10-4

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

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

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

Operational conditions: Indoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 1860 25% Fraction of Regional tonnage used locally: Annual site tonnage (tonnes/year): 465 1274 Average Local Daily Tonnage (kg/day):

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

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

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of

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

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

5.00x10-3

0.01

Not applicable.

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: 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

Section 3.1Workers Exposure estimated Contributing exposure scenario convessels/large containers at non-dedicated containers.	trolling worker exposure for	0: Transfer of substance or pre	paration (charging/discharging) from/to
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Section 3.1Workers Exposure estimate Contributing exposure scenario con		1: Non industrial 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, 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 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

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

Total release for regional

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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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: 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

Justification

During emission mg/m³ 0 Not evaluated. **EUSES** calculation 3.94x10-10 Annual average mg/m³ 0 **EUSES** calculation Annual deposition mg/m2/d Not evaluated. **EUSES** calculation **Local concentration** PEC aquatic (local+regional) Justification Not applicable. Micro-organism mg/l Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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

Section 3.2 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 3: Electroplating.

Release from point source

Not applicable.

Total release for regional

Not applicable.

	(local exposure estimation) kg/day	exposure estimation kg/day	Justilication
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	Not applicable.
	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

Tetraethylenepentamine, TEPA

Micro-organism mg/l

Identified use name: Use of ethylenamines in open processes with high exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% - Professional Process Category: PROC08a, PROC11

Substance supplied to that use in form of: In a mixture Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ERC08a, ERC08b, ERC08c, ERC08e, ERC08f, ERC11a, ERC12a, ERC12b

Not applicable.

Justification

Local concentration PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation dwt 0.077 Grassland averaged mg/kg dwt **EUSES** calculation 7.69x10-4 Groundwater mg/l Not evaluated. **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 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	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 3.2 Environment Exposure estimation

Contributing exposure 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	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	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

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

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 Environment Exposure estimation

Contributing exposure 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	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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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 Environment Exposure estimation

Contributing exposure 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	30.3	EUSES calculation
Soil (direct releases only)	Not evaluated.	0	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

Justification Concentration in sewage (PECstp) Not applicable as there is no **EUSES** calculation release to wastewater. mg/l Concentration in sewage sludge Not applicable as there is no **EUSES** calculation mg/kg dwt release to wastewater. PEC aquatic (local+regional) **Justification Local concentration** Fresh water mg/l 0 4.37x10-4 **EUSES** calculation Marine water mg/l n 4.34x10-5 **EUSES** calculation Intermittent release. mg/l Not applicable. Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. 0.221 **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 0.077 **EUSES** calculation dwt Grassland averaged mg/kg dwt 0.077 **EUSES** calculation Not evaluated. 7.69x10-4 Groundwater mg/l **EUSES** calculation PEC air (local+regional) **Justification Local concentration** During emission mg/m³ Not evaluated. **EUSES** calculation Annual average mg/m³ 0 3.94x10-10 **EUSES** calculation Annual deposition mg/m2/d 0 Not evaluated. **EUSES** calculation PEC aquatic (local+regional) **Local concentration Justification** Micro-organism mg/l Not applicable. Not applicable. Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	Not applicable.
	Value	Justification	
Concentration in sewage (PECstp) mg/l	Not applicable as there is no release to wastewater.	EUSES calculation	
Concentration in sewage sludge mg/kg dwt	Not applicable as there is no release to wastewater.	EUSES calculation	
	Local concentration	PEC aquatic (local+regional)	Justification
Fresh water mg/l	0	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
	Local Concentration	i Lo aquatic (local regional)	oustilloution

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

Section 4: Guidance to check compliance with the exposure scenario

Environment	Not available.
Health	Not available.

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

Environment	Not applicable.
Health	Not applicable.
Additional good practices	Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

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

Section 1: Title

Short title of the exposure scenario 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% -

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

List of use descriptors Identified use name: Use of preparations containing ethylenamines in open processes with low exposure

potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -

Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

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

Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 2: Operational conditions and risk management measures

Section 2.1 Control of worker exposure

Contributing exposure 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%

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

Not applicable.

Not applicable.

Other operational conditions affecting worker 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.

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial 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:

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 2% -

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.

. Industrial

Industrial

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

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 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker 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.

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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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).

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

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

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

removal efficiency of (%): 90%

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

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

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

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

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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, industrial setting

Other operational conditions affecting worker 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 environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% 186 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 510

Frequency and duration of use: Continuous release

Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

7.36x10-4

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) No wastewater treatment required. Not applicable as there is no release to wastewater.

to provide the required removal efficiency of 3 (%): Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewater

Conditions and measures related to municipal sewage treatment

plant:

Assumed domestic sewage treatment plant flow (m3/d): 2000

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% -

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

. Industrial

and articles (multistage and/or signi	•		
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.055	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Local, 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 3.1Workers Exposure estimate	ation		
Contributing exposure scenario con		1: Calendering operations	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.055	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute 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.

open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -İndustrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC13

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. Since the substance is not classified for 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 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure 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. 0 110 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.305 Long term exposure, Systemic, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable and Not Not applicable. evaluated. Long term exposure, Local, Dermal Not applicable and Not Not applicable. Not applicable. evaluated. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, 0.61 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure 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, 0.055 The ECETOC TRA tool has been used to 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, 0.61 The ECETOC TRA tool has been used to Not applicable estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Long term exposure, Systemic, Not applicable and Not Not applicable. Not applicable. Combined evaluated Long term exposure, Local, Dermal Not applicable and Not Not applicable. Not applicable. evaluated.

Tetraethylenepentamine, TEPA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture

Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Long term exposure, Local, 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, Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Dermal has been derived Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for

Short term exposure, Local,

Inhalable

Not applicable.

1.22

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 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Route of exposure Long term exposure, Systemic, **Contributing scenarios**

Not applicable. 0.055

Dose/Concentration

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic, Inhalable

Not applicable.

0.61

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic, Combined

evaluated.

Long term exposure, Local, Dermal Not applicable and Not

Not applicable and Not

evaluated.

Not applicable. Not applicable.

Not applicable.

Long term exposure, Local, Inhalable

Not applicable

Not applicable

Not applicable.

Since the substance is not classified for acute effects and therefore, no acute DNEL

has been derived.

Since the substance is not classified for

Dermal

Short term exposure, Systemic,

Not applicable

Not applicable. Not applicable.

acute effects and therefore, no acute DNEL has been derived

Since the substance is not classified for

Inhalable

Short term exposure, Systemic,

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 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 5: Treatment of articles by dipping and pouring

Route of exposure Long term exposure, Systemic,

Dermal

Contributing scenarios Not applicable.

0.110

Dose/Concentration

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Tetraethylenepentamine, TEPA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -. Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC16

Substance supplied to that use in form of: In a mixture Sector of end use: SU03

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Long term exposure, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
	Not applicable and Not evaluated.	Not applicable.	Not applicable.
	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3.1Workers Exposure estimation

Contributing exposure 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,	Not applicable.	Not applicable.	Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	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	

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, PROC13

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

Local concentration PEC aquatic (local+regional) **Justification** Fresh water mg/l 0 **EUSES** calculation 4.37x10-4 Marine water mg/l 0 4.34x10-5 **EUSES** calculation Not applicable. Intermittent release. mg/l Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation PEC soil (local+regional) **Local concentration** Justification Agricultural soil averaged mg/kg 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.

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 preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Industrial

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC13, PROC16

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)

Identification of the substance or mixture

Product definition Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

Section 1: Title

Short title of the exposure scenario 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% -

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

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 of worker exposure

Contributing exposure 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%

Not applicable. Amounts used: 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 operational conditions affecting worker exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

dispersion and exposure:

Personal protection:

Organisational measures to prevent/limit releases, 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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial 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:

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Tetraethylenepentamine, TEPA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% -

Industrial Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC16

Substance supplied to that use in form of: In a mixture

Sector of end use: SU03

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Industrial

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker 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.

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 2.1 Control of worker exposure

Contributing exposure 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.

Indoor, industrial setting Other operational conditions affecting worker exposure:

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

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 2.1 Control of worker exposure

Contributing exposure 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: Continuous release.

Human factors not influenced by risk management: Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Indoor, industrial setting

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 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

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 2.1 Control of worker exposure

Contributing exposure scenario controlling worker exposure for 6: Treatment of articles by dipping and pouring

Product Characteristics: Liquid. Covers concentrations up to 0.5%

Not applicable. Amounts used: Frequency and duration of use: Continuous release.

Default breathing volume Light work 10: m³/d Default Body weight: Workers: 70 kg Human factors not influenced by risk management:

Other operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, industrial setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Not applicable.

Personal protection: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 Other operational conditions of use 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):

Technical conditions and measures at process level (source) to

prevent release:

Not applicable.

7.36x10-4

Technical on-site conditions and measures to reduce or limit

discharges, air emissions and releases to soil:

Soil emission controls are not applicable as there is no direct release to soil.

Tetraethylenepentamine, TEPA

Identified use name: Use of 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.

Treat air emission to provide a typical removal efficiency of (%):

No air emission controls required; required removal efficiency is 0%.

to provide the required removal efficiency of 3 (%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to wastewater.

Organisational measures to prevent/limit release from site:

Prevent discharge of undissolved substance to or recover from onsite

wastewater.

Conditions and measures related to municipal sewage treatment

plant:

2000 Assumed domestic sewage treatment plant flow (m3/d):

Section 3: Exposure estimation

Section 3.1Workers Exposure estim	ation		
Contributing exposure scenario con and articles (multistage and/or signi		lixing or blending in batch proces	sses for formulation of preparations*
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 3.1Workers Exposure estim		talandarian arrantiana	
Contributing exposure scenario con	trolling worker exposure for 1: 0	•	
Contributing exposure scenario con Route of exposure	strolling worker exposure for 1: 0 Contributing scenarios	Dose/Concentration	Justification
Contributing exposure scenario con Route of exposure Long term exposure, Systemic, Dermal	trolling worker exposure for 1: C Contributing scenarios Not applicable.	Dose/Concentration Not applicable.	Not applicable.
Contributing exposure scenario con Route of exposure Long term exposure, Systemic,	strolling worker exposure for 1: 0 Contributing scenarios	Dose/Concentration	
Contributing exposure scenario con Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic,	trolling worker exposure for 1: C Contributing scenarios Not applicable.	Dose/Concentration Not applicable.	Not applicable.
Contributing exposure scenario con Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic, Inhalable Long term exposure, Systemic,	Contributing scenarios Not applicable. Not applicable. Not applicable.	Dose/Concentration Not applicable. Not applicable.	Not applicable. Not applicable.
Contributing exposure scenario con Route of exposure Long term exposure, Systemic, Dermal Long term exposure, Systemic, Inhalable Long term exposure, Systemic, Combined	Contributing scenarios Not applicable. Not applicable. Not applicable.	Dose/Concentration Not applicable. Not applicable. Not applicable.	Not applicable. Not applicable. Not applicable.
Contributing exposure scenario con 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 Not applicable. Not applicable. Not applicable. Not applicable.	Not applicable. Not applicable. Not applicable. Not applicable.
Contributing exposure scenario con 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, Inhalable Short term exposure, Systemic,	Contributing scenarios Not applicable.	Dose/Concentration Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Contributing exposure scenario con 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, Inhalable Short term exposure, Systemic, Dermal Short term exposure, Systemic,	Contributing scenarios Not applicable.	Dose/Concentration Not applicable.	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Contributing exposure scenario con 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, Inhalable Short term exposure, Systemic, Dermal Short term exposure, Systemic, Inhalable Short term exposure, Systemic, Inhalable Short term exposure, Systemic, Inhalable Short term exposure, Systemic,	Contributing scenarios Not applicable.	Dose/Concentration 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

Section 3.1Workers Exposure estima			
Contributing exposure scenario con vessels/large containers at non-dedi		: Transfer of substance or prepa	aration (charging/discharging) from/to
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable 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.	1.52	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 3.1Workers Exposure estimate Contributing exposure scenario convessels/large containers at dedicate	trolling worker exposure for 3	: Transfer of substance or prepa	aration (charging/discharging) from/to
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.

Not applicable.

Not applicable.

Tetraethylenepentamine, TEPA

Short term exposure, Local,

Inhalable

Short term exposure, Local, Dermal Not applicable.

Not applicable.

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 0.5% -Industrial

Not applicable.

Not applicable.

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 3.1Workers Exposure estimate	ation		
Contributing exposure scenario con filling line, including weighing)	trolling worker exposure for 4: 1	Fransfer of substance or preparat	ion into small containers (dedicated
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Dermal	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Inhalable	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Systemic, Combined	Not applicable.	Not applicable.	Not applicable.
Short term exposure, Local, Dermal Short term exposure, Local, Inhalable	Not applicable. Not applicable.	Not applicable. Not applicable.	Not applicable. Not applicable.
Section 3.1Workers Exposure estimate Contributing exposure scenario con		Roller application or brushing	
Route of exposure	Contributing scenarios	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Not applicable.	0.027	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.76	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable 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.	1.52	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

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

below this value

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 3.1Workers Exposure estimate Contributing exposure scenario con		6: Treatment of articles by dipp	ing and pouring
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 3.1Workers Exposure estimated Contributing exposure scenario con be expected		7: Using material as fuel source	es, limited exposure to unburned product to
Route of exposure	Contributing scenarios	Dose/Concentration	Justification

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 Environment Exposure estimation

Contributing exposure 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	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

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.

Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation **Local concentration** PEC soil (local+regional) **Justification** Agricultural soil averaged mg/kg 3.27x10-6 0.077 **EUSES** calculation dwt Grassland averaged mg/kg dwt 6.48x10-6 0.077 **EUSES** calculation Groundwater mg/l 7.69x10-4 Not evaluated. **EUSES** calculation PEC air (local+regional) **Justification Local concentration** During emission mg/m³ 1.30x10-7 Not evaluated. **EUSES** calculation

Annual average mg/m³ 1.30x10-7 Not evaluated. 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.

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 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

Annex to the extended Safety Data Sheet (eSDS)

Identification of the substance or mixture

Product definition Multi-constituent substance **Product name** Tetraethylenepentamine, TEPA

Section 1: Title

Short title of the exposure scenario 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% -

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

List of use descriptors Identified use name: Use of preparations containing ethylenamines in open processes with low exposure

potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -

Professional

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC16

Substance supplied to that use in form of: In a mixture

Sector of end use: SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Section 2: Operational conditions and risk management measures

Section 2.1 Control of worker exposure

Contributing exposure 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%

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

Not applicable.

Not applicable.

Other operational conditions affecting worker 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:

dispersion and exposure:

Personal protection:

Organisational measures to prevent/limit releases, 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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, professional setting Not applicable.

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases, dispersion and exposure:

Personal protection:

Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

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 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

Professional

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure: Personal protection:

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 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Technical conditions and measures to control dispersion

from source towards the worker:

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable. Not applicable.

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker 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 2.1 Control of worker exposure

Contributing exposure 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 operational conditions affecting worker 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:

Indoor, professional setting

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.

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% -

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

Professional Professional

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity Personal protection:

training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.1 Control of worker exposure

Contributing exposure 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

Other operational conditions affecting worker exposure: Indoor, professional setting

Technical conditions and measures at process level

(source) to prevent release:

Not applicable.

Technical conditions and measures to control dispersion

from source towards the worker:

Not applicable.

Organisational measures to prevent/limit releases,

dispersion and exposure:

Personal protection:

Not applicable.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls.

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

Regional use tonnage (tonnes/year): 1860 Fraction of Regional tonnage used locally: 10% 186 Annual site tonnage (tonnes/year): Average Local Daily Tonnage (kg/day): 510

Frequency and duration of use: Continuous release

Emission Days (days/year):

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None. Other operational conditions of use affecting environmental

7.36x10-4

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):

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

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 on-site wastewater (prior to receiving water discharge) No wastewater treatment required. Not applicable as there is no release to

wastewater.

to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site: Conditions and measures related to municipal sewage treatment

plant:

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 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

Route of exposure	Contributing segretics	Dose/Concentration	Justification
Long term exposure, Systemic, Dermal	Contributing scenarios Not applicable.	0.055	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute 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 DNEI has been derived.
Short term exposure, Local, Inhalable	Not applicable.	1.22	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Section 3.1Workers Exposure estimate			
Contributing exposure scenario con			lundification
Route of exposure Long term exposure, Systemic, Dermal	Contributing scenarios Not applicable.	Dose/Concentration 0.055	Justification The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
Long term exposure, Systemic, Combined	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Dermal	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNE has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEI has been derived.

open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% -Professional

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC10

Substance supplied to that use in form of: In a mixture

Sector of end use: SU22

Subsequent service life relevant for that use: No. Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Short term exposure, Systemic, Not applicable. Since the substance is not classified for 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 estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Section 3.1Workers Exposure estimation Contributing exposure 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. 0 110 **Dermal** estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value The ECETOC TRA tool has been used to 0.305 Long term exposure, Systemic, Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable. Long term exposure, Systemic, Not applicable and Not Not applicable. evaluated. Long term exposure, Local, Dermal Not applicable and Not Not applicable. Not applicable. evaluated. Long term exposure, Local, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived Short term exposure, Systemic, Not applicable. Not applicable Since the substance is not classified for acute effects and therefore, no acute DNEL **Dermal** has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Inhalable has been derived. Since the substance is not classified for Not applicable. Short term exposure, Systemic, Not applicable acute effects and therefore, no acute DNEL Combined has been derived. Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived Short term exposure, Local, 0.61 The ECETOC TRA tool has been used to Not applicable. Inhalable estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value **Section 3.1Workers Exposure estimation** Contributing exposure 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, 0.055 The ECETOC TRA tool has been used to 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, 0.61 The ECETOC TRA tool has been used to Not applicable. estimate workplace exposures unless Inhalable otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value Not applicable and Not Long term exposure, Systemic, Not applicable. Not applicable. Combined evaluated Long term exposure, Local, Dermal Not applicable and Not Not applicable. Not applicable. evaluated.

Tetraethylenepentamine, TEPA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC10

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, 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, Since the substance is not classified for Not applicable acute effects and therefore, no acute DNEL Dermal has been derived Since the substance is not classified for Short term exposure, Systemic, Not applicable Not applicable. acute effects and therefore, no acute DNEL Inhalable has been derived. Short term exposure, Systemic, Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL Combined has been derived Short term exposure, Local, Dermal Not applicable Not applicable. Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived. Short term exposure, Local, Not applicable. 1.22 The ECETOC TRA tool has been used to estimate workplace exposures unless Inhalable

Section 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 4: Transfer of substance or preparation into small containers (dedicated

filling line, including weighing)

Long term exposure, Systemic,

Contributing scenarios Dose/Concentration Justification Route of exposure

Not applicable.

0.055

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

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.

0.61

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic, Combined

Not applicable and Not evaluated.

Not applicable.

Not applicable.

Long term exposure, Local, Dermal Not applicable and 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,

Long term exposure, Local,

Dermal

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, 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

Combined

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.

Since the substance is not classified for

acute effects and therefore, no acute DNEL

Short term exposure, Local,

Inhalable

Not applicable.

1.22

has been derived. The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the

highest exposure level is given since the

exposure estimates for other PROC are below this value

Section 3.1Workers Exposure estimation

Contributing exposure scenario controlling worker exposure for 5: Roller application or brushing

Route of exposure

Dermal

Contributing scenarios Not applicable.

0.110

Dose/Concentration

Justification

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Tetraethylenepentamine, TEPA

Long term exposure, Systemic,

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, Systemic, Inhalable	Not applicable.	0.305	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value
	Not applicable and Not evaluated.	Not applicable.	Not applicable.
	Not applicable and Not evaluated.	Not applicable.	Not applicable.
Long term exposure, Local, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Inhalable	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Systemic, Combined	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Dermal	Not applicable	Not applicable.	Since the substance is not classified for acute effects and therefore, no acute DNEL has been derived.
Short term exposure, Local, Inhalable	Not applicable.	0.61	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are below this value

Section 3.1Workers Exposure estimation

Contributing exposure 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,	Not applicable.	Not applicable.	Not applicable.

Section 3.2 Environment Exposure estimation

Contributing exposure 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	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	

Tetraethylenepentamine, TEPA

Identified use name: Use of preparations containing ethylenamines in open processes with low exposure potential and evaporation as most likely exposure form - Use of preparations containing EA up to 2% - Professional

Process Category: PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC10, PROC10

Substance supplied to that use in form of: In a mixture

Sector of end use: SU22

Subsequent service life relevant for that use: No.

Environmental Release Category: ERC01, ERC02, ERC04, ERC10b

Local concentration PEC aquatic (local+regional) **Justification** Fresh water mg/l 0 **EUSES** calculation 4.37x10-4 Marine water mg/l 0 4.34x10-5 **EUSES** calculation Not applicable. Intermittent release. mg/l Not applicable. Not applicable. **Local concentration** PEC sediment (local+regional) **Justification** Fresh water sediment mg/kg dwt Not evaluated. **EUSES** calculation Marine water sediment mg/kg dwt Not evaluated. 0.022 **EUSES** calculation PEC soil (local+regional) **Local concentration** Justification Agricultural soil averaged mg/kg 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 PEC air (local+regional) **Local concentration Justification** Not evaluated. During emission mg/m³ 1.30x10-7 **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.

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. Not applicable. **Additional good practices**

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 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.

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 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% -

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

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 worker exposure

Contributing exposure 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%

Not applicable. Amounts used:

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.

Other operational conditions affecting worker 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.

Wear chemical-resistant gloves (tested to EN374) in combination with specific activity Personal protection: training. Wear chemical-resistant gloves (tested to EN374) in combination with intensive

management supervision controls.

Section 2.2: Control of environmental exposure

Contributing exposure scenario controlling environmental exposure for 0: Fuel additive.

Operational conditions: Indoor/Outdoor use.

Product Characteristics: Not applicable.

Concentration of substance in mixture or article:

Amounts used:

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

Frequency and duration of use: Continuous release.

Emission Days (days/year): 365

Environmental factors not influenced by risk management:

Local marine water dilution factor: 1000 None.

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.

Other operational conditions of use 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):

Technical conditions and measures at process level (source) to prevent release:

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:

Treat air emission to provide a typical removal efficiency of (%):

Treat on-site wastewater (prior to receiving water discharge) No wastewater treatment required. to provide the required removal efficiency of 3 (%):

Organisational measures to prevent/limit release from site:

Conditions and measures related to municipal sewage treatment plant:

7.36x10-4

Not applicable.

Soil emission controls are not applicable as there is no direct release to soil.

No air emission controls required; required removal efficiency is 0%.

Section 3: Exposure estimation

Section 3.1Workers Exposure estimation

Contributing exposure 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.

0.027

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value

Long term exposure, Systemic,

Inhalable

Not applicable.

0.76

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. The PROC with the highest exposure level is given since the exposure estimates for other PROC are

below this value Not applicable.

Long term exposure, Systemic,

Not applicable and Not

evaluated.

Long term exposure, Local, Dermal Not applicable and Not

evaluated.

Not applicable. Not applicable.

Long term exposure, Local,

Inhalable

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,

Short term exposure, Local,

Short term exposure, Local, Dermal Not applicable

Combined

Inhalable

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 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

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 Environment Exposure estimation

Contributing exposure scenario controlling environmental exposure for 0: Fuel additive.

	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)	4.69x10-4	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	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

Section 4: Guidance to check compliance with the exposure scenario

Environment Not available. Health Not available.

Not applicable.

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

Micro-organism mg/l

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

Not applicable.

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