SAFETY DATA SHEET

Diethylenetriamine, DETA

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

1.1 Product identifier

Product name : Diethylenetriamine, DETA

Index number : 612-058-00-X

EC number : 203-865-4

REACH Registration number

Registration number	Legal entity
01-2119473793-27-0001	-

CAS number : 111-40-0

Other means of identification : -

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

Product use : Intermediate.

Identified uses
ES1: Manufacture of substance - Industrial: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15; ERC01 **ES2:** Formulation and (re)packing of substances and mixtures - Industrial: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15; ERC02 **ES3:** Use at industrial sites - Use as an intermediate: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15; ERC06a **ES4:** Use at industrial sites - Use as a polyurethane curing agent for rigid foam production: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15; ERC06c, ERC06d **ES5:** Use at industrial sites - Use as an epoxy curing agent: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15; ERC06c, ERC06d **ES6:** Use at industrial sites - Use as a processing aid/additive: PROC02, PROC05, PROC08a, PROC08b, PROC13; ERC04 **ES7:** Widespread use by professional workers - Use as a polyurethane curing agent for rigid foam production: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19; ERC08c, ERC08f **ES8:** Widespread use by professional workers - Use as an epoxy curing agent: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19; ERC08c, ERC08f **Further information - Identified uses (Industrial, Professional):** Ashless dispersant (Industrial): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18; ERC04 Corrosion inhibitor (Industrial): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b; ERC04 Electroplating. (Industrial): PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC13, PROC15; ERC04 Ashless dispersant (Professional): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18, PROC20; ERC08a, ERC08d **ES9:** Consumer use - Use as an epoxy and polyurethane curing agent: PC01; ERC08c, ERC08f **Further information - Identified uses (Consumer):** Ashless dispersant (Consumer): PC24; ERC08a, ERC08d

See Annex to the Safety data sheet for additional information in the Exposure Scenario(s).

1.3 Details of the supplier of the safety data sheet

Delamine B.V.
Stationsplein 121
3818LE Amersfoort
The Netherlands
Telephone number: +31-334224600

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

e-mail address of person responsible for this SDS : sds.delamine@delamine.com

1.4 Emergency telephone number

Supplier

Telephone number : +1 352 323 3500 (24 h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mono-constituent substance

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

Acute Tox. 4, H302
Acute Tox. 4, H312
Acute Tox. 2, H330
Skin Corr. 1B, H314
Eye Dam. 1, H318
Skin Sens. 1B, H317
STOT SE 3, H335

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the 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 : H330 - Fatal if inhaled.
H302 + H312 - Harmful if swallowed or in contact with skin.
H314 - Causes severe skin burns and eye damage.
H317 - May cause an allergic skin reaction.
H335 - May cause respiratory irritation.

Precautionary statements

Prevention : P280 - Wear protective gloves. Wear protective clothing. Wear eye or face protection.
P260 - Do not breathe vapour.

Response : P304 + P340 + P310 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician.
P303 + P361 + P353 + P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Immediately call a POISON CENTER or physician.
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.

Disposal : Not applicable.

Hazardous ingredients : 2,2'-iminodiethylamine

Supplemental label elements : Not applicable.

SECTION 2: Hazards identification

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

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII :

PBT	P	B	T	vPvB	vP	vB
No	No	No	No	No	No	No

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

SECTION 3: Composition/information on ingredients

3.1 Substances : Mono-constituent substance

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
2,2'-iminodiethylamine	REACH #: 01-2119473793-27 EC: 203-865-4 CAS: 111-40-0 Index: 612-058-00-X	100	Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 2, H330 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1B, H317 STOT SE 3, H335 **See Section 16 for the full text of the H statements declared above.**	[A]

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

[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.

SECTION 4: First aid measures

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

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

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

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Fatal if inhaled. May cause respiratory irritation.

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

Ingestion : Harmful if swallowed.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

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 dry chemical, CO_2, water spray (fog) or foam. Dry sand or other suitable absorbent. Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : Do not use water jet.

SECTION 5: Firefighting measures

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.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

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

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

Additional information (Explosibility) : Not considered to be a product presenting a risk of explosion.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

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

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

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

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

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

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. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds (in tonnes)

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
H2: Acute toxicity 2 any route of entry or Acute toxicity 3 Inhalation route of entry or Note 7	50	200

7.3 Specific end use(s)

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).

SECTION 8: Exposure controls/personal protection

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

Product/ingredient name	Exposure limit values
2,2'-iminodiethylamine	**EH40/2005 WELs (United Kingdom (UK), 8/2018). Absorbed through skin.** TWA: 4.3 mg/m³ 8 hours. TWA: 1 ppm 8 hours.

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

SECTION 8: Exposure controls/personal protection

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
2,2'-iminodiethylamine	DNEL	Short term Inhalation	92.1 mg/m³	Workers	Systemic
	DNEL	Short term Inhalation	2.6 mg/m³	Workers	Local
	DNEL	Long term Dermal	11.4 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	15.4 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	1.1 mg/cm²	Workers	Local
	DNEL	Long term Inhalation	0.87 mg/m³	Workers	Local
	DNEL	Short term Dermal	4.88 mg/kg bw/day	General population [Consumers]	Systemic
	DNEL	Short term Inhalation	27.5 mg/m³	General population [Consumers]	Systemic
	DNEL	Long term Dermal	4.88 mg/kg bw/day	General population [Consumers]	Systemic
	DNEL	Long term Inhalation	4.6 mg/m³	General population [Consumers]	Systemic

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
2,2'-iminodiethylamine	Fresh water	0.56 mg/l	-
	Marine water	0.056 mg/l	-
	Intermittent release	0.32 mg/l	-
	Fresh water sediment	1072 mg/kg dwt	-
	Marine water sediment	107.2 mg/kg dwt	-
	Soil	7.97 mg/kg dwt	-
	Sewage Treatment Plant	6 mg/l	-

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. 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

SECTION 8: Exposure controls/personal protection

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

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

Skin protection

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

Recommended: Wear suitable gloves tested to EN374.
> 8 hours (breakthrough time): butyl rubber (thickness ≥0.3 mm), nitrile rubber (thickness ≥0.4 mm), Chloroprene (thickness ≥0.65 mm).

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.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Recommended: Combination filtering device (DIN EN 14387), Filter type: A-P2.

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. [Viscous liquid.]

Colour : Colourless. Yellow.

Odour : Ammoniacal.

Odour threshold : Not available.

pH : 11.6 [Conc. (% w/w): 1%]

Melting point/freezing point : -39°C

Initial boiling point and boiling range : 207°C

Flash point : Closed cup: 96.7°C

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Upper/lower flammability or explosive limits : Not available.

SECTION 9: Physical and chemical properties

Vapour pressure	:	0.021 kPa [room temperature]
Vapour density	:	Not available.
Relative density	:	Not available.
Density	:	0.9586 g/cm³ [20°C]
Solubility(ies)	:	Not available.
Solubility in water	:	Miscible in water.
Partition coefficient: n-octanol/ water	:	-1.58
Auto-ignition temperature	:	358°C
Decomposition temperature	:	Not available.
Viscosity	:	Dynamic (room temperature): 5.05 mPa·s
Explosive properties	:	Not considered to be a product presenting a risk of explosion.
Oxidising properties	:	None.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

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

10.2 Chemical stability : The product is stable.

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

10.4 Conditions to avoid : aerosol or mist formation.
Keep away from heat, sparks and flame. Do not smoke.

10.5 Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials, metals, acids. 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	Remarks
2,2'-iminodiethylamine	LD50 Dermal	Rabbit	1045 mg/kg	-	-
	LD50 Oral	Rat	1620 mg/kg	-	-

Conclusion/Summary : Fatal if inhaled. Harmful if swallowed or in contact with skin.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
2,2'-iminodiethylamine	1620	1045	N/A	0.5	N/A

Irritation/Corrosion

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation	Remarks
2,2'-iminodiethylamine	Skin - Visible necrosis	Rabbit	-	15 minutes	15 minutes	-
	Eyes - Oedema of the conjunctivae	Rabbit	6	-	8 days	-
	Eyes - Cornea opacity	Rabbit	4	-	8 days	-

Conclusion/Summary

Skin : Causes severe burns.

Eyes : Causes serious eye damage.

Respiratory : May cause respiratory irritation.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result	Remarks
2,2'-iminodiethylamine	skin	Guinea pig	Sensitising [OECD 406]	-

Conclusion/Summary

Skin : May cause an allergic skin reaction.

Mutagenicity

Product/ingredient name	Test	Experiment	Result	Remarks
2,2'-iminodiethylamine	-	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
	OECD 488	Experiment: In vivo Subject: Mammalian-Animal	Negative	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Carcinogenicity

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

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Developmental toxin	Species	Dose	Exposure	Remarks
2,2'-iminodiethylamine	Negative	-	Negative	Rat	Dermal: 30 mg/kg NOAEL	-	OECD 421

Conclusion/Summary : Based on available data, the classification criteria are not met.

Teratogenicity

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

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
2,2'-iminodiethylamine	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

SECTION 11: Toxicological information

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Fatal if inhaled. May cause respiratory irritation.

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

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
2,2'-iminodiethylamine	Sub-acute NOEL Inhalation Vapour	Rat - Male, Female	0.55 mg/l	15 days; 6 hours per day	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

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.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure	Remarks
2,2'-iminodiethylamine	Acute EC50 1164 mg/l Fresh water [OECD 201]	Algae	72 hours	-
	Acute EC50 32 mg/l Fresh water	Daphnia	48 hours	-
	Acute LC50 430 mg/l Fresh water [EU C.1]	Fish	96 hours	-
	Chronic NOEC 10 mg/l Fresh water [OECD 201]	Algae	72 hours	-
	Chronic NOEC 5.6 mg/l Fresh water [EU C.2]	Daphnia - Daphnia magna	21 days	-
	Chronic NOEC >10 mg/l Fresh water [OECD 210]	Fish	28 days	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
2,2'-iminodiethylamine	OECD 301D	87 % - Readily - 21 days	-	-

Conclusion/Summary : Readily biodegradable.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
2,2'-iminodiethylamine	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
2,2'-iminodiethylamine	-1.58	0.3 to 6.3	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Low mobility in soil predicted, based on log Kow < 3.0.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
2,2'-iminodiethylamine	No	No	No	No	No	No	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

SECTION 13: Disposal considerations

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

The allocation of waste identity numbers/waste descriptions must be carried out according to the EWC, specific to the industry and process.

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

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible.

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

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN2079	UN2079	UN2079	UN2079
14.2 UN proper shipping name	DIETHYLENETRIAMINE	DIETHYLENETRIAMINE	DIETHYLENETRIAMINE	Diethylenetriamine
14.3 Transport hazard class(es)	8	8	8	8
Label				
14.4 Packing group	II	II	II	II
14.5 Environmental hazards	No.	No.	Marine Pollutant: No	No.

Additional information

ADR/RID : **Hazard identification number** 80
Limited quantity 1 L
Tunnel code (E)

IMDG : **Emergency schedules** F-A, S-B

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 1 L. Packaging instructions: 851. Cargo Aircraft Only: 30 L. Packaging instructions: 855. Limited Quantities - Passenger Aircraft: 0.5 L. Packaging instructions: Y840.

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

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Proper shipping name : Diethylenetriamine
Ship type : 3
Pollution category : Y

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

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

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

Other EU regulations

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
H2: Acute toxicity 2 any route of entry or Acute toxicity 3 Inhalation route of entry or Note 7

National regulations

Hazchem code : 2X

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia inventory (AICS) : All components are listed or exempted.

Canada : All components are listed or exempted.

China : All components are listed or exempted.

Europe : All components are listed or exempted.

Japan : **Japan inventory (ENCS):**
All components are listed or exempted.
Japan inventory (ISHL):
All components are listed or exempted.

New Zealand : All components are listed or exempted.

Philippines : All components are listed or exempted.

Republic of Korea : All components are listed or exempted.

Diethylenetriamine, DETA

SECTION 15: Regulatory information

Taiwan : All components are listed or exempted.

Turkey : All components are listed or exempted.

United States : All components are listed or exempted.

15.2 Chemical safety assessment : Complete.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
EWC = European Waste Catalogue
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

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

Classification	Justification
Acute Tox. 4, H302	Calculation method
Acute Tox. 4, H312	Calculation method
Acute Tox. 2, H330	Calculation method
Skin Corr. 1B, H314	Expert judgment
Eye Dam. 1, H318	On basis of test data
Skin Sens. 1B, H317	Expert judgment
STOT SE 3, H335	Calculation method

Full text of abbreviated H statements

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.

Full text of classifications [CLP/GHS]

SECTION 16: Other information

Acute Tox. 2, H330	ACUTE TOXICITY (inhalation) - Category 2
Acute Tox. 4, H302	ACUTE TOXICITY (oral) - Category 4
Acute Tox. 4, H312	ACUTE TOXICITY (dermal) - Category 4
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Skin Corr. 1B, H314	SKIN CORROSION/IRRITATION - Category 1B
Skin Sens. 1B, H317	SKIN SENSITISATION - Category 1B
STOT SE 3, H335	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3

Date of printing : 30/07/2019

Date of issue/ Date of revision : 30/07/2019

Date of previous issue : 26/01/2018

Version : 13

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Ashless dispersant (Industrial)

List of use descriptors : **Identified use name: Further information - Identified uses (Industrial, Professional):**
Ashless dispersant (Industrial): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18; ERC04
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04

Environmental contributing scenarios : **Use of non-reactive processing aid at industrial site (no inclusion into or onto article) -** ERC04

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Transfer of substance or mixture into small containers (dedicated filling line, including weighing) - PROC09
Roller application or brushing - PROC10
Treatment of articles by dipping and pouring - PROC13
Lubrication at high energy conditions in metal working operations - PROC17
General greasing/lubrication at high kinetic energy conditions - PROC18

Additional information : Function: Intermediate (precursor).

Remark: No exposure scenario developed - Concentrations of substance <0.1% in these products.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for:

Not available.

Contributing scenario controlling worker exposure for:

Not available.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: All Contributing scenarios

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation and reference to its source - Workers: All Contributing scenarios

Exposure assessment (human): : No human health risk assessment was performed.

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

General : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Corrosion inhibitor (Industrial)

List of use descriptors : **Identified use name:** Corrosion inhibitor (Industrial): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b; ERC04
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04

Environmental contributing scenarios : **Use of non-reactive processing aid at industrial site (no inclusion into or onto article) -** ERC04

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b

Additional information : Function: Intermediate (precursor).

Remark: No exposure scenario developed - Concentrations of substance <0.1% in these products.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for:

Not available.

Contributing scenario controlling worker exposure for:

Not available.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: All Contributing scenarios

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation and reference to its source - Workers: All Contributing scenarios

Exposure assessment (human): : No human health risk assessment was performed.

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

General : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Electroplating. (Industrial)

List of use descriptors : **Identified use name:** Electroplating. (Industrial): PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC13, PROC15; ERC04
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC13, PROC15
Substance supplied to that use in form of: As such
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04

Environmental contributing scenarios : **Use of non-reactive processing aid at industrial site (no inclusion into or onto article) -** ERC04

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Mixing or blending in batch processes - PROC05
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Treatment of articles by dipping and pouring - PROC13
Use as laboratory reagent - PROC15

Additional information : Function: Intermediate (precursor).

Remark: No exposure scenario developed - Volumes of substance <1 mT total.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for:

Not available.

Contributing scenario controlling worker exposure for:

Not available.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: All Contributing scenarios

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation and reference to its source - Workers: All Contributing scenarios

Exposure assessment (human): : No human health risk assessment was performed.

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

General	:	Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Ashless dispersant (Professional)

List of use descriptors : **Identified use name:** Ashless dispersant (Professional): PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18, PROC20; ERC08a, ERC08d
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC17, PROC18, PROC20
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08a, ERC08d

Environmental contributing scenarios : **Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) -** ERC08a
Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) - ERC08d

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Transfer of substance or mixture into small containers (dedicated filling line, including weighing) - PROC09
Roller application or brushing - PROC10
Treatment of articles by dipping and pouring - PROC13
Lubrication at high energy conditions in metal working operations - PROC17
General greasing/lubrication at high kinetic energy conditions - PROC18
Use of functional fluids in small devices - PROC20

Additional information : Function: Intermediate (precursor).

Remark: No exposure scenario developed - Concentrations of substance <0.1% in these products.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for:

Not available.

Contributing scenario controlling worker exposure for:

Not available.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: All Contributing scenarios

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation and reference to its source - Workers: All Contributing scenarios

Exposure assessment (human): : No human health risk assessment was performed.

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

General : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Manufacture of substance - Industrial.

List of use descriptors : **Identified use name: ES1:** Manufacture of substance - Industrial: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15; ERC01
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC01

Environmental contributing scenarios : **Manufacture of substance -** ERC01

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Use as laboratory reagent - PROC15

Number of the ES : 1

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Manufacture of substance

Amounts used : Daily amount per site: ≤143.3 tonnes/day.
Annual amount per site: ≤43000 tonnes/year.

Frequency and duration of use : Emission days: ≥300 days per year.

Environment factors not influenced by risk management : Receiving surface water flow: ≥18000 m³/d.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 0.00015%.
Local release rate: 0.215 kg/day.

Release to air from process:
Release factor after on-site risk management: 0.0000102%.
Local release rate: 0.015 kg/day.

Release to soil from process:
Release factor after on-site risk management: 0%.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.
Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases. Storage of finished products in closed containers (e.g., bulk tanks, drums, cans).
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Substance/Task appropriate gloves. Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation - efficiency of at least 90% (Inhalation).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 7: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Manufacture of substance

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00954mg/l.
Risk characterisation ratio (PEC/PNEC): 0.017.

Freshwater sediment: 0.036 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000901 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.016.

Marine water sediment: 0.00339 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.014 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.00732 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000485 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.043 mg/m³.
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.034 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.43 mg/m³.
Risk characterisation ratio: 0.028.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.04.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³.
Risk characterisation ratio: 0.837.

Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.843.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.149 mg/m³.
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day.
Risk characterisation ratio: 0.06.

Worker - combined, long-term - systemic: 0.2.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.399.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.511.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.706.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.034 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.589.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Formulation and (re)packing of substances and mixtures - Industrial.

List of use descriptors : **Identified use name: ES2:** Formulation and (re)packing of substances and mixtures - Industrial: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15; ERC02
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02
Market sector by type of chemical product: PC01

Environmental contributing scenarios : **Formulation and (re)packing of substances and mixtures** - ERC02

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions** - PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Chemical production where opportunity for exposure arises (AEROSOLS) - PROC04
Mixing or blending in batch processes - PROC05
Mixing or blending in batch processes (AEROSOLS) - PROC05
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (indoor) - PROC09
Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (outdoor) - PROC09
Use as laboratory reagent - PROC15

Number of the ES : 2

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Formulation and (re)packing of substances and mixtures

Amounts used : Daily amount per site: ≤195.5 tonnes/day (Msperc).
Annual amount per site: ≤43000 tonnes/year.

Frequency and duration of use : Emission days: 220 days per year.

Environment factors not influenced by risk management : Receiving surface water flow: ≥18000 m³/d.

Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA 2.1b.v2) Release to air from process: Release factor after on-site risk management: 0.12%. (FEICA 2.1b.v2) Local release rate: 234.6 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA 2.1b.v2)
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Solvent-based process. (FEICA) Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste. (FEICA) Process with efficient use of raw materials. (FEICA)
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations.

Contributing scenario controlling worker exposure for 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.

- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 90% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Chemical production where opportunity for exposure arises (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 90% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 7: Mixing or blending in batch processes

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 90% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Mixing or blending in batch processes (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation - efficiency of at least 90% (Inhalation).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 12: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (indoor)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 90% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 13: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (outdoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 14: Use as laboratory reagent

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Formulation and (re)packing of substances and mixtures

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.018 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.039 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.043 mg/m³.
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.0034 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.291.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³.
Risk characterisation ratio: 0.837.

Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.843.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.149 mg/m³.
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day.
Risk characterisation ratio: 0.06.

Worker - combined, long-term - systemic: 0.2.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Chemical production where opportunity for exposure arises (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.5 mg/m³.
Risk characterisation ratio: 0.575.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.149 mg/m³.
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 2.742 mg/kg bw/day.
Risk characterisation ratio: 0.241.

Worker - combined, long-term - systemic: 0.38.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Mixing or blending in batch processes (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.5 mg/m³.
Risk characterisation ratio: 0.575.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 2.742 mg/kg bw/day.
Risk characterisation ratio: 0.241.

Worker - combined, long-term - systemic: 0.52.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.511.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.706.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 12: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (indoor)

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 2.149 mg/m³. Risk characterisation ratio: 0.14. **Worker - dermal, long-term - systemic:** 0.686 mg/kg bw/day. Risk characterisation ratio: 0.06. **Worker - combined, long-term - systemic:** 0.2.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 13: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (outdoor)

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.686 mg/kg bw/day. Risk characterisation ratio: 0.06. **Worker - combined, long-term - systemic:** 0.646.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 14: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.034 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.589.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Use at industrial sites - Use as an intermediate.

List of use descriptors : **Identified use name: ES3:** Use at industrial sites - Use as an intermediate: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15; ERC06a
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC06a

Environmental contributing scenarios : **Use of intermediate -** ERC06a

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor) - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Use as laboratory reagent - PROC15

Number of the ES : 3

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Use of intermediate

Amounts used : Daily amount per site: ≤143.3 tonnes/day.
Annual amount per site: ≤43000 tonnes/year.

Frequency and duration of use : Emission days: ≥300 days per year.

Environment factors not influenced by risk management : Receiving surface water flow: ≥18000 m³/d.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 0.02%. (SpERC ESVOC 6.1a.v1)
Local release rate: 28.67 kg/day.

Release to air from process:
Release factor after on-site risk management: 0.002%. (SpERC ESVOC 6.1a.v1)
Local release rate: 2.867 kg/day.

Release to soil from process:
Release factor after on-site risk management: 0.002%. (SpERC ESVOC 6.1a.v1)

Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases.
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation - efficiency of at least 90% (Inhalation).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 7: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Outdoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced.

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Use of intermediate

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.19 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.339.

Freshwater sediment: 0.713 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.019 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.338.

Marine water sediment: 0.071 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 1.814 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.302.

Soil: 0.014 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.000657 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 2: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.043 mg/m³.
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.0034 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.291.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³.
Risk characterisation ratio: 0.837.

Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.843.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.149 mg/m³.
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day.
Risk characterisation ratio: 0.06.

Worker - combined, long-term - systemic: 0.2.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (indoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.399.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (outdoor)

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.511.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - dermal, long-term - local:** 0.1 mg/cm². Risk characterisation ratio: 0.091. **Worker - combined, long-term - systemic:** 0.706.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.027 mg/m³. Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.068 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.592.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Use at industrial sites - Use as a polyurethane curing agent for rigid foam production.

List of use descriptors : **Identified use name: ES4:** Use at industrial sites - Use as a polyurethane curing agent for rigid foam production: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15; ERC06c, ERC06d
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC06c, ERC06d

Environmental contributing scenarios : **Use as a polyurethane curing agent for rigid foam production -** ERC06c
Use as a polyurethane curing agent for rigid foam production - ERC06d

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Chemical production where opportunity for exposure arises (AEROSOLS) - PROC04
Mixing or blending in batch processes - PROC05
Mixing or blending in batch processes (AEROSOLS) - PROC05
Industrial spraying - PROC07
Industrial spraying (AEROSOLS) - PROC07
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Roller application or brushing - PROC10
Treatment of articles by dipping and pouring - PROC13
Use as laboratory reagent - PROC15

Number of the ES : 4

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Use as a polyurethane curing agent for rigid foam production

Amounts used : Daily amount per site: ≤48.2 tonnes/day.
Annual amount per site: ≤10644 tonnes/year.

Frequency and duration of use : Emission days: ≥220 days per year.

Environment factors not influenced by risk management : Receiving surface water flow: ≥18000 m³/d.

Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2) Release to air from process: Release factor after on-site risk management: 1.7%. (FEICA SpERC 5.1b.v2) Local release rate: 819.1 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2)
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.
Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases. Storage of finished products in closed containers (e.g., bulk tanks, drums, cans).
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling environmental exposure for 2: Use as a polyurethane curing agent for rigid foam production

Amounts used	:	Daily amount per site: ≤48.2 tonnes/day. Annual amount per site: ≤10644 tonnes/year.
Frequency and duration of use	:	Emission days: ≥220 days per year.
Environment factors not influenced by risk management	:	Receiving surface water flow: ≥18000 m³/d.
Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2) Release to air from process: Release factor after on-site risk management: 1.7%. (FEICA SpERC 5.1b.v2) Local release rate: 819.1 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2)
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.
Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases. Storage of finished products in closed containers (e.g., bulk tanks, drums, cans).
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice.

- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Mixing or blending in batch processes

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Mixing or blending in batch processes (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 10: Industrial spraying

Spraying (automatic/robotic)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 95% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 11: Industrial spraying (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 95% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 12: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 13: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 14: Roller application or brushing

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 15: Treatment of articles by dipping and pouring

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 16: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Use as a polyurethane curing agent for rigid foam production

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.045 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.138 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Environment: 2: Use as a polyurethane curing agent for rigid foam production

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.

Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.045 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.138 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.0086 mg/m³.
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.00068 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.86 mg/m³.
Risk characterisation ratio: 0.056.

Worker - dermal, long-term - systemic: 0.027 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.058.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.579 mg/m³.
Risk characterisation ratio: 0.168.

Worker - dermal, long-term - systemic: 0.014 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - dermal, short-term - local: 0.00402 mg/cm².

Worker - combined, long-term - systemic: 0.169.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.579 mg/m³.
Risk characterisation ratio: 0.168.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.18.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.6 mg/m³.
Risk characterisation ratio: 0.69.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.579 mg/m³.
Risk characterisation ratio: 0.168.

Worker - dermal, long-term - systemic: 0.274 mg/kg bw/day.
Risk characterisation ratio: 0.024.

Worker - combined, long-term - systemic: 0.192.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Mixing or blending in batch processes (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.6 mg/m³.
Risk characterisation ratio: 0.69.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 10: Industrial spraying

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.857 mg/kg bw/day.
Risk characterisation ratio: 0.075.

Worker - combined, long-term - systemic: 0.354.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 11: Industrial spraying (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.2 mg/m³.
Risk characterisation ratio: 0.23.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 12: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 8.597 mg/m³.
Risk characterisation ratio: 0.558.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.606.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 13: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.274 mg/kg bw/day.
Risk characterisation ratio: 0.024.

Worker - combined, long-term - systemic: 0.303.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 14: Roller application or brushing

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 8.597 mg/m³.
Risk characterisation ratio: 0.558.

Worker - dermal, long-term - systemic: 0.549 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.606.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 15: Treatment of articles by dipping and pouring

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 8.597 mg/m³.
Risk characterisation ratio: 0.558.

Worker - dermal, long-term - systemic: 0.274 mg/kg bw/day.
Risk characterisation ratio: 0.024.

Worker - combined, long-term - systemic: 0.582.

Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 16: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 4.299 mg/m³. Risk characterisation ratio: 0.279. **Worker - dermal, long-term - systemic:** 0.0068 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.28.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Use at industrial sites - Use as an epoxy curing agent.

List of use descriptors : **Identified use name: ES5:** Use at industrial sites - Use as an epoxy curing agent: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15; ERC06c, ERC06d
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC10, PROC13, PROC15
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC06c, ERC06d

Environmental contributing scenarios : **Epoxy curing agent -** ERC06c
Epoxy curing agent - ERC06d

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Chemical production where opportunity for exposure arises (AEROSOLS) - PROC04
Mixing or blending in batch processes - PROC05
Mixing or blending in batch processes (AEROSOLS) - PROC05
Industrial spraying - PROC07
Industrial spraying (AEROSOLS) - PROC07
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Roller application or brushing - PROC10
Treatment of articles by dipping and pouring - PROC13
Use as laboratory reagent - PROC15

Number of the ES : 5

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Epoxy curing agent

Amounts used : Daily amount per site: ≤48.2 tonnes/day.
Annual amount per site: ≤10644 tonnes/year.

Frequency and duration of use : Emission days: ≥220 days per year.

Environment factors not influenced by risk management : Receiving surface water flow: ≥18000 m³/d.

Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2) Release to air from process: Release factor after on-site risk management: 1.7%. (FEICA SpERC 5.1b.v2) Local release rate: 819.1 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2)
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.
Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases. Storage of finished products in closed containers (e.g., bulk tanks, drums, cans).
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent

Amounts used	:	Daily amount per site: ≤48.2 tonnes/day. Annual amount per site: ≤10644 tonnes/year.
Frequency and duration of use	:	Emission days: ≥220 days per year.
Environment factors not influenced by risk management	:	Receiving surface water flow: ≥18000 m³/d.
Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2) Release to air from process: Release factor after on-site risk management: 1.7%. (FEICA SpERC 5.1b.v2) Local release rate: 819.1 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2)
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Incinerate, absorb, or adsorb vapours stripped from solution whenever necessary.
Organisational measures to prevent/limit release from site	:	General good practice: Trained staff, spill protection including waste reuse. Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases. Storage of finished products in closed containers (e.g., bulk tanks, drums, cans).
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice.

- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 90% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Mixing or blending in batch processes

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation - efficiency of at least 90% (Inhalation).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Mixing or blending in batch processes (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation - efficiency of at least 90% (Inhalation).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 10: Industrial spraying

Spraying (automatic/robotic)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 95% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 95%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 11: Industrial spraying (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation - efficiency of at least 95% (Inhalation).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 95%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 12: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

or: Ensure operation is undertaken outdoors.

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 13: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 14: Roller application or brushing

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 15: Treatment of articles by dipping and pouring

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 16: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Advanced.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Epoxy curing agent

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.045 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.138 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Environment: 2: Epoxy curing agent

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.045 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.138 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.02 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.0034 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.15 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.152.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.45 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.419.

Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.425.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 10.75 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.698.

Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day.
Risk characterisation ratio: 0.06.

Worker - combined, long-term - systemic: 0.758.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.25 mg/m³.
Risk characterisation ratio: 0.287.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 1.07 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.069.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.19.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Mixing or blending in batch processes (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.25 mg/m³.
Risk characterisation ratio: 0.287.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 10: Industrial spraying

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 10.75 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.698.

Worker - dermal, long-term - systemic: 2.143 mg/kg bw/day.
Risk characterisation ratio: 0.188.

Worker - combined, long-term - systemic: 0.886.

Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 11: Industrial spraying (AEROSOLS)

Exposure assessment (human):	:	ESIG ESVOC 3
Exposure estimation	:	**Worker - inhalative, long-term - local:** 0.5 mg/m³. Risk characterisation ratio: 0.575.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 12: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.03 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.823 mg/kg bw/day. Risk characterisation ratio: 0.072. **Worker - combined, long-term - systemic:** 0.659.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 13: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 10.75 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.698. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.818.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 14: Roller application or brushing

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.03 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 1.646 mg/kg bw/day. Risk characterisation ratio: 0.144. **Worker - combined, long-term - systemic:** 0.731.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 15: Treatment of articles by dipping and pouring

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.03 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 0.823 mg/kg bw/day. Risk characterisation ratio: 0.072. **Worker - combined, long-term - systemic:** 0.659.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 16: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 7.52 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.488. **Worker - dermal, long-term - systemic:** 0.034 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.491.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition	:	Mono-constituent substance
Product name	:	Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario	:	Use at industrial sites - Use as a processing aid/additive.
List of use descriptors	:	**Identified use name: ES6:** Use at industrial sites - Use as a processing aid/additive: PROC02, PROC05, PROC08a, PROC08b, PROC13; ERC04 **Process Category:** PROC02, PROC05, PROC08a, PROC08b, PROC13 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC04
Environmental contributing scenarios	:	**Use of non-reactive processing aid at industrial site (no inclusion into or onto article) -** ERC04
Health Contributing scenarios	:	**Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions -** PROC02 **Mixing or blending in batch processes -** PROC05 **Transfer of substance or mixture (charging and discharging) at non-dedicated facilities -** PROC08a **Transfer of substance or mixture (charging and discharging) at dedicated facilities -** PROC08b **Treatment of articles by dipping and pouring -** PROC13
Number of the ES	:	6

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Amounts used	:	Daily amount per site: ≤35.3 tonnes/day. Annual amount per site: ≤10644 tonnes/year.
Frequency and duration of use	:	Emission days: ≥300 days per year.
Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2) Release to air from process: Release factor after on-site risk management: 1.7%. (FEICA SpERC 5.1b.v2) Local release rate: 600.6 kg/day. Release to soil from process: Release factor after on-site risk management: 0%. (FEICA SpERC 5.1b.v2)
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%) Discharge rate: ≥2000 m³/d. Application of the STP sludge on agricultural soil: Yes.
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 3: Mixing or blending in batch processes

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 4: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 5: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

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

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00818 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Freshwater sediment: 0.031 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000765 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.014.

Marine water sediment: 0.00288 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.045 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.138 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.291.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.149 mg/m³.
Risk characterisation ratio: 0.14.

Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day.
Risk characterisation ratio: 0.12.

Worker - combined, long-term - systemic: 0.26.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 4.299 mg/m³. Risk characterisation ratio: 0.279. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.399.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 2.149 mg/m³. Risk characterisation ratio: 0.14. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.26.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Treatment of articles by dipping and pouring

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 4.299 mg/m³. Risk characterisation ratio: 0.279. **Worker - dermal, long-term - systemic:** 1.371 mg/kg bw/day. Risk characterisation ratio: 0.12. **Worker - combined, long-term - systemic:** 0.399.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Widespread use by professional workers - Use as a polyurethane curing agent for rigid foam production.

List of use descriptors : **Identified use name: ES7:** Widespread use by professional workers - Use as a polyurethane curing agent for rigid foam production: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19; ERC08c, ERC08f
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08c, ERC08f

Environmental contributing scenarios : **Use as a polyurethane curing agent for rigid foam production -** ERC08c
Use as a polyurethane curing agent for rigid foam production - ERC08f

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Chemical production where opportunity for exposure arises (AEROSOLS) - PROC04
Mixing or blending in batch processes - PROC05
Mixing or blending in batch processes (AEROSOLS) - PROC05
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Roller application or brushing - PROC10
Non industrial spraying - PROC11
Non industrial spraying (AEROSOLS) - PROC11
Treatment of articles by dipping and pouring - PROC13
Use as laboratory reagent - PROC15
Manual activities involving hand contact - PROC19
Manual activities involving hand contact (AEROSOLS) - PROC19

Number of the ES : 7

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Use as a polyurethane curing agent for rigid foam production

Amounts used : Daily local widespread use amount: ≤0.0059 tonnes/day.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 1.5%. (FEICA 8c.3.v2)
Local release rate: 0.088 kg/day.

Release to air from process:
Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Release to soil from process:

Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Organisational measures to prevent/limit release from site : Application of solvent-borne or water-borne products. (FEICA)
Covers indoor and outdoor use. (FEICA)
Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste. (FEICA)
Process with efficient use of raw materials. (FEICA)

Conditions and measures related to sewage treatment plant : Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)

Conditions and measures related to external treatment of waste for disposal : Particular considerations on the waste treatment operations.

Contributing scenario controlling environmental exposure for 2: Use as a polyurethane curing agent for rigid foam production

Amounts used : Daily local widespread use amount: ≤0.0059 tonnes/day.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 1.5%. (FEICA 8c.3.v2)
Local release rate: 0.088 kg/day.

Release to air from process:
Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Release to soil from process:
Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Conditions and measures related to sewage treatment plant : Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)

Conditions and measures related to external treatment of waste for disposal : Particular considerations on the waste treatment operations.
Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

or: Ensure operation is undertaken outdoors.

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Mixing or blending in batch processes

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice.

- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Mixing or blending in batch processes (AEROSOLS)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

or: Ensure operation is undertaken outdoors.

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 12: Roller application or brushing

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 13: Non industrial spraying

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 14: Non industrial spraying (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 15: Treatment of articles by dipping and pouring

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 16: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 5%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure :
- Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 17: Manual activities involving hand contact

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 18: Manual activities involving hand contact (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 5%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice.

- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Use as a polyurethane curing agent for rigid foam production

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00874 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.016.

Freshwater sediment: 0.033 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000821 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Marine water sediment: 0.00308 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.00556 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.00729 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000151 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Environment: 2: Use as a polyurethane curing agent for rigid foam production

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00874 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.016.

Freshwater sediment: 0.033 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000821 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Marine water sediment: 0.00308 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.00556 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.00729 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000151 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.0086 mg/m³.
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.00136 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.299 mg/m³.
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.055 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.284.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 2.579 mg/m³.
Risk characterisation ratio: 0.168.

Worker - dermal, long-term - systemic: 0.028 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: 0.17.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 0.274 mg/kg bw/day.
Risk characterisation ratio: 0.024.

Worker - combined, long-term - systemic: 0.415.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.7 mg/m³.
Risk characterisation ratio: 0.805.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.439.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Mixing or blending in batch processes (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.7 mg/m³.
Risk characterisation ratio: 0.805.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³.
Risk characterisation ratio: 0.837.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.886.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 8.597 mg/m³.
Risk characterisation ratio: 0.558.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.606.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 12: Roller application or brushing

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 9.027 mg/m³.
Risk characterisation ratio: 0.586.

Worker - dermal, long-term - systemic: 1.097 mg/kg bw/day.
Risk characterisation ratio: 0.096.

Worker - combined, long-term - systemic: 0.682.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 13: Non industrial spraying

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 6.018 mg/m³.
Risk characterisation ratio: 0.391.

Worker - dermal, long-term - systemic: 4.286 mg/kg bw/day.
Risk characterisation ratio: 0.376.

Worker - combined, long-term - systemic: 0.767.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 14: Non industrial spraying (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.28 mg/m³.
Risk characterisation ratio: 0.322.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 15: Treatment of articles by dipping and pouring

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 8.597 mg/m³.
Risk characterisation ratio: 0.558.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.606.

Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 16: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 4.299 mg/m³. Risk characterisation ratio: 0.279. **Worker - dermal, long-term - systemic:** 0.014 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.28.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 17: Manual activities involving hand contact

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 3.009 mg/m³. Risk characterisation ratio: 0.195. **Worker - dermal, long-term - systemic:** 5.657 mg/kg bw/day. Risk characterisation ratio: 0.496. **Worker - combined, long-term - systemic:** 0.692.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 18: Manual activities involving hand contact (AEROSOLS)

Exposure assessment (human):	:	ESIG ESVOC 3
Exposure estimation	:	**Worker - inhalative, long-term - local:** 0.14 mg/m³. Risk characterisation ratio: 0.161.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Widespread use by professional workers - Use as an epoxy curing agent.

List of use descriptors : **Identified use name: ES8:** Widespread use by professional workers - Use as an epoxy curing agent: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19; ERC08c, ERC08f
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC15, PROC19
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08c, ERC08f

Environmental contributing scenarios : **Epoxy curing agent -** ERC08c
Epoxy curing agent - ERC08f

Health Contributing scenarios : **Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions -** PROC01
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions - PROC02
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition - PROC03
Chemical production where opportunity for exposure arises - PROC04
Chemical production where opportunity for exposure arises (AEROSOLS) - PROC04
Mixing or blending in batch processes - PROC05
Mixing or blending in batch processes (AEROSOLS) - PROC05
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a
Transfer of substance or mixture (charging and discharging) at dedicated facilities - PROC08b
Roller application or brushing - PROC10
Non industrial spraying - PROC11
Non industrial spraying (AEROSOLS) - PROC11
Treatment of articles by dipping and pouring - PROC13
Use as laboratory reagent - PROC15
Manual activities involving hand contact - PROC19
Manual activities involving hand contact (AEROSOLS) - PROC19

Number of the ES : 8

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Epoxy curing agent

Amounts used : Daily local widespread use amount: ≤0.0059 tonnes/day.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 1.5%. (FEICA 8c.3.v2)
Local release rate: 0.088 kg/day.

Release to air from process:
Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Release to soil from process:
Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)

Organisational measures to prevent/limit release from site	:	Application of solvent-borne or water-borne products. (FEICA) Covers indoor and outdoor use. (FEICA) Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste. (FEICA) Process with efficient use of raw materials. (FEICA)
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations.

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent

Amounts used	:	Daily local widespread use amount: ≤0.0059 tonnes/day.
Other conditions affecting environmental exposure	:	Release to waste water from process: Release factor after on-site risk management: 1.5%. (FEICA 8c.3.v2) Local release rate: 0.088 kg/day. Release to air from process: Release factor after on-site risk management: 0%. (FEICA 8c.3.v2) Release to soil from process: Release factor after on-site risk management: 0%. (FEICA 8c.3.v2)
Conditions and measures related to sewage treatment plant	:	Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)
Conditions and measures related to external treatment of waste for disposal	:	Particular considerations on the waste treatment operations. Dispose of waste product or used containers according to local regulations.

Contributing scenario controlling worker exposure for 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) or: Ensure operation is undertaken outdoors.

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 6: Chemical production where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 8: Mixing or blending in batch processes

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 9: Mixing or blending in batch processes (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 1 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Respiratory protection : Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers exposure up to 4 hours per day.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 12: Roller application or brushing

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 13: Non industrial spraying

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation) Local exhaust ventilation - efficiency of at least 80% (Inhalation, Dermal). or: Ensure operation is undertaken outdoors.
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 95%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 14: Non industrial spraying (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear suitable gloves tested to EN374. (Efficiency of at least 80%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 15: Treatment of articles by dipping and pouring

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers exposure up to 4 hours per day.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Advanced. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30% - Inhalation)

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 16: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 50%.

Physical state : Liquid.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours.

Other conditions affecting workers exposure : Indoor use.
Process temperature: ≤40 °C.

Technical conditions and measures to control dispersion from source towards the worker : Occupational Health and Safety Management System: Basic.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : - Containment as appropriate.
- Minimise number of staff exposed.
- Segregation of the emitting process.
- Effective contaminant extraction.
- Good standard of general ventilation.
- Minimisation of manual phases.
- Avoid contact with contaminated tools and objects..
- Regular cleaning of equipment and work area.
- Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed.
- Training for staff on good practice.
- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear suitable gloves tested to EN374. (Efficiency of at least 80%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Contributing scenario controlling worker exposure for 17: Manual activities involving hand contact

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice. - Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection	:	Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 95%) Skin coverage with appropriate barrier material based on potential for contact with the chemicals. Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact. Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.
Respiratory protection	:	Respiratory protection (Efficiency of at least 90%).

Contributing scenario controlling worker exposure for 18: Manual activities involving hand contact (AEROSOLS)

Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 50%.
Physical state	:	Liquid.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours.
Other conditions affecting workers exposure	:	Indoor use. Process temperature: ≤40 °C.
Technical conditions and measures to control dispersion from source towards the worker	:	Occupational Health and Safety Management System: Basic. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	:	- Containment as appropriate. - Minimise number of staff exposed. - Segregation of the emitting process. - Effective contaminant extraction. - Good standard of general ventilation. - Minimisation of manual phases. - Avoid contact with contaminated tools and objects.. - Regular cleaning of equipment and work area. - Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. - Training for staff on good practice.

- Good standard of personal hygiene.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90%)
Skin coverage with appropriate barrier material based on potential for contact with the chemicals.
Wear chemically resistant face shield, goggles or safety glasses with side shields when there is potential for direct contact.
Avoid contact with skin. Avoid contact with eyes. Wash off any skin contamination immediately.

Respiratory protection : Respiratory protection (Efficiency of at least 90%).

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Epoxy curing agent

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00874 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.016.

Freshwater sediment: 0.033 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000821 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Marine water sediment: 0.00308 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.00556 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.00729 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000151 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Environment: 2: Epoxy curing agent

Exposure assessment (environment): : EUSES 2.1.2

Exposure estimation : Freshwater: 0.00874 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.016.

Freshwater sediment: 0.033 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.000821 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.015.

Marine water sediment: 0.00308 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.00556 mg/l.
Risk characterisation ratio (PEC/PNEC): <0.01.

Soil: 0.00729 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000151 mg/m³.

Risk characterisation ratio (PEC/PNEC): Not available.

Remark : Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 3: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 0.02 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: <0.01.

Worker - dermal, long-term - systemic: 0.0068 mg/kg bw/day.
Risk characterisation ratio: <0.01.

Worker - combined, long-term - systemic: <0.01.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 4: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 10.75 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.698.

Worker - dermal, long-term - systemic: 0.274 mg/kg bw/day.
Risk characterisation ratio: 0.024.

Worker - combined, long-term - systemic: 0.722.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 5: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.51 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.293.

Worker - dermal, long-term - systemic: 0.138 mg/kg bw/day.
Risk characterisation ratio: 0.012.

Worker - combined, long-term - systemic: 0.305.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 6: Chemical production where opportunity for exposure arises

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.838.

Worker - dermal, long-term - systemic: 0.823 mg/kg bw/day.
Risk characterisation ratio: 0.072.

Worker - combined, long-term - systemic: 0.91.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 7: Chemical production where opportunity for exposure arises (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.5 mg/m³.
Risk characterisation ratio: 0.575.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 8: Mixing or blending in batch processes

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 4.3 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.279.

Worker - dermal, long-term - systemic: 0.548 mg/kg bw/day.
Risk characterisation ratio: 0.048.

Worker - combined, long-term - systemic: 0.327.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 9: Mixing or blending in batch processes (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.5 mg/m³.
Risk characterisation ratio: 0.575.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 10: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 5.37 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.349.

Worker - dermal, long-term - systemic: 2.742 mg/kg bw/day.
Risk characterisation ratio: 0.241.

Worker - combined, long-term - systemic: 0.589.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 11: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 12.9 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.838.

Worker - dermal, long-term - systemic: 1.645 mg/kg bw/day.
Risk characterisation ratio: 0.144.

Worker - combined, long-term - systemic: 0.982.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 12: Roller application or brushing

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 3.76 mg/m³ (ECETOC TRA worker v3 with modifications).
Risk characterisation ratio: 0.244.

Worker - dermal, long-term - systemic: 3.292 mg/kg bw/day.
Risk characterisation ratio: 0.289.

Worker - combined, long-term - systemic: 0.533.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 13: Non industrial spraying

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - systemic:** 3.02 mg/m³.
Risk characterisation ratio: 0.196.

Worker - dermal, long-term - systemic: 1.07 mg/kg bw/day.
Risk characterisation ratio: 0.094.

Worker - combined, long-term - systemic: 0.29.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 14: Non industrial spraying (AEROSOLS)

Exposure assessment (human): : ESIG ESVOC 3

Exposure estimation : **Worker - inhalative, long-term - local:** 0.7 mg/m³.
Risk characterisation ratio: 0.805.

Remark : Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 15: Treatment of articles by dipping and pouring

Exposure assessment (human): : ECETOC TRA worker v3

Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 9.03 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.586. **Worker - dermal, long-term - systemic:** 1.645 mg/kg bw/day. Risk characterisation ratio: 0.144. **Worker - combined, long-term - systemic:** 0.731.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 16: Use as laboratory reagent

Exposure assessment (human):	:	ECETOC TRA worker v3
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 10.75 mg/m³ (ECETOC TRA worker v3 with modifications). Risk characterisation ratio: 0.698. **Worker - dermal, long-term - systemic:** 0.068 mg/kg bw/day. Risk characterisation ratio: <0.01. **Worker - combined, long-term - systemic:** 0.704.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 17: Manual activities involving hand contact

Exposure assessment (human):	:	ECETOC TRA worker v3 with modifications
Exposure estimation	:	**Worker - inhalative, long-term - systemic:** 5.37 mg/m³. Risk characterisation ratio: 0.349. **Worker - dermal, long-term - systemic:** 7.07 mg/kg bw/day. Risk characterisation ratio: 0.62. **Worker - combined, long-term - systemic:** 0.969.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

Exposure estimation and reference to its source - Workers: 18: Manual activities involving hand contact (AEROSOLS)

Exposure assessment (human):	:	ESIG ESVOC 3
Exposure estimation	:	**Worker - inhalative, long-term - local:** 0.25 mg/m³. Risk characterisation ratio: 0.287.
Remark	:	Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR < 1).

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

General	:	The immediate downstream user is required to evaluate whether the operational conditions and risk management measures described in the exposure scenario fit to his use. If other OC/RMM are adopted, the user has to ensure that risks are managed to at least equivalent levels. The risk assessment methods/tools given in section 3 may be used for this evaluation.
Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Annex to the extended Safety Data Sheet (eSDS)

Consumer

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Consumer use - Use as an epoxy and polyurethane curing agent.

List of use descriptors : **Identified use name: ES9:** Consumer use - Use as an epoxy and polyurethane curing agent: PC01; ERC08c, ERC08f
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08c, ERC08f
Market sector by type of chemical product: PC01

Environmental contributing scenarios : **Epoxy curing agent -** ERC08c
Epoxy curing agent - ERC08f

Health Contributing scenarios : **Adhesives, sealants -** PC01

Number of the ES : 9

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Epoxy curing agent

Amounts used : Daily local widespread use amount: ≤0.0059 tonnes/day.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 5%. (ERC08f)
Local release rate: 0.293 kg/day.

Release to air from process:
Release factor after on-site risk management: 15%. (ERC08f)

Release to soil from process:
Release factor after on-site risk management: 0.5%. (ERC08f)

Conditions and measures related to sewage treatment plant : Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)

Conditions and measures related to external treatment of waste for disposal : Particular considerations on the waste treatment operations.

Contributing scenario controlling environmental exposure for 2: Epoxy curing agent

Amounts used : Daily local widespread use amount: ≤0.0059 tonnes/day.

Other conditions affecting environmental exposure : Release to waste water from process:
Release factor after on-site risk management: 30%. (ERC08c)
Local release rate: 1.756 kg/day.

Release to air from process:
Release factor after on-site risk management: 15%. (ERC08c)

Release to soil from process:
Release factor after on-site risk management: 0%. (ERC08c)

Conditions and measures related to sewage treatment plant : Sewage Treatment Plant: Yes. (Efficiency of at least 87.34%)

Conditions and measures related to external treatment of waste for disposal : Particular considerations on the waste treatment operations.

Contributing scenario controlling consumer exposure for 3: Adhesives, sealants

Product characteristics	:	Inhalation exposure: Yes. Dermal exposure: Yes.
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 35%.
Physical state	:	Liquid.
Amounts used	:	Amount per use: ≤5 g/event. Skin contact: ≤0.1 g/event.
Frequency and duration of use/exposure	:	Exposure duration: 6 h/event. Infrequent, 1 events per day Inhalation exposure: ≤10 min/event. Application duration: ≤30 min.
Other given operational conditions affecting consumers exposure	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. Inhalation factor: 1. Dermal transfer factor: 1. Covers skin contact area up to 43 cm². Room volume: ≥20 m³. Ventilation rate: ≥0.6 ach (air changes per hour). Release area: ≤0.05 m². Adult/Child assumed: Adult.
Area of use:	:	Indoor use.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Epoxy curing agent

Exposure assessment (environment):	:	EUSES 2.1.2
Exposure estimation	:	Freshwater: 0.01 mg/l. Risk characterisation ratio (PEC/PNEC): 0.018. Freshwater sediment: 0.038 mg/kg dwt. Risk characterisation ratio (PEC/PNEC): <0.01. Marine water: 0.000951 mg/l. Risk characterisation ratio (PEC/PNEC): 0.017. Marine water sediment: 0.00357 mg/kg dwt. Risk characterisation ratio (PEC/PNEC): <0.01. Sewage Treatment Plant: 0.019 mg/l. Risk characterisation ratio (PEC/PNEC): <0.01. Soil: 0.00733 mg/kg dwt. Risk characterisation ratio (PEC/PNEC): <0.01. Air: 0.00000151 mg/m³. Risk characterisation ratio (PEC/PNEC): Not available.

Exposure estimation and reference to its source - Environment: 2: Epoxy curing agent

Exposure assessment (environment):	:	EUSES 2.1.2

Exposure estimation : Freshwater: 0.019 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.034.

Freshwater sediment: 0.073 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Marine water: 0.00188 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.034

Marine water sediment: 0.00705 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Sewage Treatment Plant: 0.111 mg/l.
Risk characterisation ratio (PEC/PNEC): 0.019.

Soil: 0.00767 mg/kg dwt.
Risk characterisation ratio (PEC/PNEC): <0.01.

Air: 0.00000151 mg/m³.
Risk characterisation ratio (PEC/PNEC): Not available.

Exposure estimation and reference to its source - Consumers: 3: Adhesives, sealants

Exposure assessment (human): : ConsExpo web 1.0.1

Exposure estimation : **Consumer - inhalative, long-term - systemic:** 2.8 mg/m³.
Risk characterisation ratio: 0.609.

Consumer - dermal, long-term - systemic: 0.5 mg/kg bw/day.
Risk characterisation ratio: 0.103.

Consumer - combined, long-term - systemic: 0.711.

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

General : Not applicable.

Environment : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Consumer

Identification of the substance or mixture

Product definition : Mono-constituent substance

Product name : Diethylenetriamine, DETA

Section 1 - Title

Short title of the exposure scenario : Ashless dispersant (Consumer)

List of use descriptors : **Identified use name: Further information - Identified uses (Consumer):**
Ashless dispersant (Consumer): PC24; ERC08a, ERC08d
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08a, ERC08d
Market sector by type of chemical product: PC24

Environmental contributing scenarios : **Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) -** ERC08a
Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) - ERC08d

Health Contributing scenarios : **Lubricants, greases, release products -** PC24

Additional information : Function: Intermediate (precursor).

Remark: No exposure scenario developed - Concentrations of substance <0.1% in these products.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Not available.

Contributing scenario controlling environmental exposure for 2: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Not available.

Contributing scenario controlling consumer exposure for 3: Lubricants, greases, release products

Not available.

Section 3 - Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment: 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation :

Exposure estimation and reference to its source - Environment: 2: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Exposure assessment (environment): : No environmental risk assessment was performed.

Exposure estimation :

Exposure estimation and reference to its source - Consumers: 3: Lubricants, greases, release products

Exposure assessment (human): : No human health risk assessment was performed.

Exposure estimation :

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

General : Not applicable.