

SAFETY DATA SHEET

According to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

DIETHYLENETRIAMINE (DETA)

Version 2

Revision Date 13.12.2021

Print Date 20.01.2022

GB / EN

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name : DIETHYLENETRIAMINE (DETA)

Substance name : Diethylenetriamine

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

Use of the Substance/Mixture : Specific use(s): Various industrial applications

1.3 Details of the supplier of the safety data sheet

Company : Nouryon
Functional Chemicals AB
SE 444 85 Stenungsund
Sweden

Telephone : +4630385000
Telefax : +46303770551
E-mail address : QTS@nouryon.com

1.4 Emergency telephone number

Emergency telephone number : 24 hours emergency response number: +31 57 06 79211
Kemiakuten-SE: 020 99 60 00

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

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Acute toxicity, 4, H302
Acute toxicity, 2, H330
Acute toxicity, 4, H312
Skin corrosion, 1B, H314
Serious eye damage, 1, H318
Skin sensitisation, 1B, H317
Specific target organ toxicity - single exposure, 3, Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Pictogram	:	
Signal word	:	Danger
Hazard statements	:	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. H330 Fatal if inhaled. H335 May cause respiratory irritation.
Precautionary statements	:	Prevention: P260 Do not breathe mist, vapours or spray. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. Response: P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor. 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/ doctor. Storage: P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Hazardous components which must be listed on the label:

Diethylenetriamine

111-40-0

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2.3 Other hazards

No further data available.

PBT and vPvB assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Pure substance/mixture : Substance
CAS-No. : 111-40-0

Hazardous substance

Chemical name	CAS-No. EC-No.	Classification (REGULATION (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)	Concentration [%]
Diethylenetriamine	111-40-0 203-865-4	Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1B; H317 STOT SE 3; H335	>= 90 - <= 100

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

- General advice : Immediate medical attention is required.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
- If inhaled : If breathed in, move person into fresh air.
Call a physician or poison control centre immediately.
Remove to fresh air.
Keep patient warm and at rest.
If unconscious, place in recovery position and seek medical advice.
Keep respiratory tract clear.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Rinse immediately with plenty of water.
Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If skin irritation persists, call a physician.
- In case of eye contact : Rinse with plenty of water.
Get medical attention immediately. Continue to rinse during transport.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
Small amounts splashed into eyes can cause irreversible tissue damage and blindness.

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If swallowed : Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Take victim immediately to hospital.
Do not induce vomiting! May cause chemical burns in mouth and throat.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Risks : Harmful if swallowed or in contact with skin.
May cause an allergic skin reaction.
Causes serious eye damage.
Fatal if inhaled.
May cause respiratory irritation.
Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting / Specific hazards arising from the chemical : Do not allow run-off from fire fighting to enter drains or water courses.
Combustion products : Carbon oxides
Nitrogen oxides (NO_x)

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Wear respiratory protection.
Ensure adequate ventilation.

Emergency measures on accidental release : Evacuate personnel to safe areas.
Only qualified personnel equipped with suitable protective

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equipment may intervene.
Prevent unauthorised persons entering the zone.

6.2 Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system.
Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up /
Methods for containment : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For disposal considerations see section 13.
For personal protection see section 8.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling : Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

: For personal protection see section 8.
Avoid formation of aerosol.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against
fire and explosion : Avoid formation of aerosol.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage
areas and containers : Prevent unauthorized access.
Keep in a well-ventilated place.
Reacts with copper, aluminium, zinc and their alloys.

Other data : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s) : Refer to attached exposure scenario Annex.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form	Control parameters	Basis
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Diethylenetriamine	111-40-0	of exposure) TWA	1 ppm 4.3 mg/m3	GB EH40
Further information: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.				
		TWA	1 ppm	ACGIH

Derived No Effect Level (DNEL):

Substance name	End Use	Exposure routes	Potential health effects	Value
Diethylenetriamine	Workers	Inhalation	Long-term systemic effects	15.4 mg/m3
	Workers	Inhalation	Acute systemic effects	92.1 mg/m3
	Workers	Inhalation	Long-term local effects	0.87 mg/m3
	Workers	Inhalation	Acute local effects	2.6 mg/m3
	Workers	Skin contact	Long-term systemic effects	11.4 mg/kg bw/day
	Workers	Skin contact	Long-term local effects	1.1 mg/cm2
	Consumers	Inhalation	Long-term systemic effects	4.6 mg/m3
	Consumers	Inhalation	Acute systemic effects	27.5 mg/m3
	Consumers	Skin contact	Long-term systemic effects	4.88 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	4.88 mg/kg bw/day

Predicted No Effect Concentration (PNEC):

Substance name	Environmental Compartment	Value
Diethylenetriamine	Fresh water	0.56 mg/l
	Marine water	0.056 mg/l
	Intermittent water	0.32 mg/l
	Sewage treatment plant	6 mg/l
	Fresh water sediment	1072 mg/kg dry weight
	Marine sediment	107.2 mg/kg dry weight
	Soil	7.97 mg/kg dry weight

8.2 Exposure controls

Engineering measures

Effective exhaust ventilation system

Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Eye protection : Safety glasses with side-shields conforming to EN166

Hand protection

Material : butyl-rubber

Break through time : > 30 min

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Glove thickness : ≥ 0.2 mm
Directive : Protective gloves complying with EN 374.
Wearing time : < 30 min
Remarks : Wearing time < 30 minutes

Material : butyl-rubber
Break through time : > 240 min
Glove thickness : ≥ 0.6 mm
Directive : Protective gloves complying with EN 374.
Wearing time : < 240 min
Remarks : Wearing time < 240 minutes

Material : butyl-rubber
Break through time : > 480 min
Glove thickness : ≥ 0.8 mm
Directive : Protective gloves complying with EN 374.
Wearing time : < 480 min
Remarks : Wearing time < 480 minutes

Remarks : The data about break through time/strength of material are standard values! The exact break through time/strength of material has to be obtained from the producer of the protective glove.

Skin and body protection : Protective suit

Respiratory protection : In the case of vapour or aerosol formation use a respirator with an approved filter.
Wear full face mask supplied with:
Gas cartridge K (ammonia, green).

No personal respiratory protective equipment normally required.

Hygiene measures : Avoid contact with skin, eyes and clothing.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and immediately after handling the product.
Wash contaminated clothing before re-use.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.
Discharge into the environment must be avoided.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state : Clear liquid

Colour : colourless

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Odour	:	ammoniacal
Odour Threshold	:	No data available
Melting point/range	:	-39 °C (1,013 hPa)
Boiling point/boiling range	:	207 °C (1,013 hPa)
Flammability (solid, gas)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	10 %(V)
Lower explosion limit / Lower flammability limit	:	1 %(V)
Flash point	:	96.7 °C(1,013 hPa) Method: Pensky-Martens closed cup
Decomposition temperature	:	
Decomposition temperature	:	No data available
pH	:	12 (20 °C) Concentration: 100 g/l
Viscosity	:	
Viscosity, dynamic	:	5.05 mPa.s (20 °C)
Viscosity, kinematic	:	No data available
Solubility(ies)	:	
Water solubility	:	soluble
Solubility in other solvents	:	Soluble in alcohols and hydrocarbons.
Partition coefficient: n-octanol/water	:	log Pow: -1.58 (20 °C)
Vapour pressure	:	0.2 hPa (20 °C)
Relative density	:	0.959 (20 °C)
Density	:	0.957 g/cm ³ (20 °C)
Relative vapour density	:	3.6

9.2 Other information

Explosives	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

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Flammability (liquids) : Not classified as a flammability hazard

Self-ignition : 358 °C
1,013 hPa

Evaporation rate : No data available

This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Heating can release hazardous gases.

10.4 Conditions to avoid

Conditions to avoid : Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Materials to avoid : Reacts with copper, aluminium, zinc and their alloys.
Strong acids and oxidizing agents
Halogenated compounds

10.6 Hazardous decomposition products

Hazardous decomposition products : Nitrogen oxides (NO_x)

Thermal decomposition : No data available

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Product information:

Acute toxicity : Harmful if swallowed or in contact with skin.
Fatal if inhaled.

Skin corrosion/irritation : Causes severe burns.

Serious eye damage/eye irritation : Causes serious eye damage.

Respiratory or skin sensitisation : Respiratory sensitisation: Not classified based on available information.
Skin sensitisation: May cause an allergic skin reaction.

Germ cell mutagenicity : Not classified based on available information.

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Carcinogenicity	:	Not classified based on available information.
Reproductive toxicity	:	Not classified based on available information.
STOT - single exposure	:	May cause respiratory irritation.
STOT - repeated exposure	:	Not classified based on available information.
Aspiration hazard	:	Not classified based on available information.
Further information	:	No further data available.

Toxicology data for the components:

Diethylenetriamine

Acute toxicity:

Acute oral toxicity	:	LD50: > 300 - 2,000 mg/kg Species: Rat
Acute inhalation toxicity	:	LC50 (Rat): > 0.07 - 0.3 mg/l Exposure time: 4 h Test atmosphere: dust/mist dust/mist
Acute dermal toxicity	:	LD50: > 1,000 - 2,000 mg/kg Species: Rabbit
Skin corrosion/irritation	:	Result: Causes burns.
Serious eye damage/eye irritation	:	Result: Risk of serious damage to eyes.
Respiratory or skin sensitisation	:	Species: Mouse Result: The product is a skin sensitiser, sub-category 1B. Method: OECD Test Guideline 429
Germ cell mutagenicity	:	
Genotoxicity in vitro	:	Ames test Result: negative
Genotoxicity in vivo	:	Result: No evidence of genotoxic effects in vivo.
STOT - single exposure	:	Exposure routes: Inhalation Target Organs: Respiratory system May cause respiratory irritation.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
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SECTION 12: ECOLOGICAL INFORMATION

Product information:

Ecotoxicology Assessment

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

12.1 Toxicity

Components:

Test result

Diethylenetriamine

Toxicity to fish : LC50: > 100 mg/l
Exposure time: 96 h
Species: *Poecilia reticulata* (guppy)

Toxicity to daphnia and other aquatic invertebrates : EC50: > 10 - 100 mg/l
Exposure time: 48 h
Species: *Daphnia magna* (Water flea)

Toxicity to algae : EC50: > 100 mg/l
Exposure time: 72 h
Species: *Pseudokirchneriella subcapitata* (green algae)

12.2 Persistence and degradability

Product information:

Biodegradability : Result: Readily biodegradable.

Components:

Diethylenetriamine

Biodegradability : Result: Readily biodegradable.

12.3 Bioaccumulative potential

Product information:

Bioaccumulation : Bioaccumulation is unlikely.

Components:

Diethylenetriamine

Bioaccumulation : Not expected considering the low log Pow value.

12.4 Mobility in soil

Product information:

Mobility : Due to its physical and chemical properties, transport between environmental compartments is not expected

Components:

Diethylenetriamine

Mobility : The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

12.5 Results of PBT and vPvB assessment

Product information:

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PBT and vPvB assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Components:

Diethylenetriamine

PBT and vPvB assessment : This substance is not considered to be a PBT (Persistent, Bioaccumulation, Toxic)
This substance is not considered to be vPvB (very Persistent nor very Bioaccumulating)

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Product information:

Biochemical Oxygen Demand (BOD) : No data available

Components:

Diethylenetriamine

Biochemical Oxygen Demand (BOD) : No data available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of contents/container in accordance with local regulation.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number

ADR : UN 2079
RID : UN 2079
IMDG-Code : UN 2079
IATA-DGR : UN 2079

14.2 Proper shipping name

ADR : DIETHYLENETRIAMINE
RID : DIETHYLENETRIAMINE
IMDG-Code : DIETHYLENETRIAMINE
IATA-DGR : Diethylenetriamine

14.3 Transport hazard class

ADR : 8
RID : 8
IMDG-Code : 8
IATA-DGR : 8

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14.4 Packing group

ADR

Packing group : II
Classification Code : C7
Hazard Identification Number : 80
Labels : 8
Tunnel restriction code : (E)

RID

Packing group : II
Classification Code : C7
Hazard Identification Number : 80
Labels : 8

IMDG-Code

Packing group : II
Labels : 8
EmS Code : F-A, S-B

IATA-DGR

Packing instruction (cargo aircraft) : 855
Packing instruction (passenger aircraft) : 851
Packing instruction (LQ) : Y840
Packing group : II
Labels : 8

14.5 Environmental hazards

ADR

Environmentally hazardous : no

RID

Environmentally hazardous : no

IMDG-Code

Marine pollutant : no

IATA-DGR

Environmentally hazardous : no

14.6 Special precautions for user

Not applicable

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

Not applicable for product as supplied.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

UK REACH List of substances subject to authorisation (Annex XIV) : Not applicable

Notification status

TCSI : YES. On the inventory, or in compliance with the inventory
TSCA : YES. All substances listed as active on the TSCA inventory

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AIIC	: YES. On the inventory, or in compliance with the inventory
DSL	: YES. All components of this product are on the Canadian DSL
ENCS	: YES. On the inventory, or in compliance with the inventory
ISHL	: YES. On the inventory, or in compliance with the inventory
KECI	: YES. On the inventory, or in compliance with the inventory
PICCS	: YES. On the inventory, or in compliance with the inventory
IECSC	: YES. On the inventory, or in compliance with the inventory
NZIoC	: YES. On the inventory, or in compliance with the inventory
TECI	: NO. Not in compliance with the inventory

For explanation of abbreviation see section 16.

15.2 Chemical safety assessment

Diethylenetriamine : A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

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 other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
GB EH40	: UK. EH40 WEL - Workplace Exposure Limits
ACGIH / TWA	: 8-hour, time-weighted average
GB EH40 / TWA	: Long-term exposure limit (8-hour TWA reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect

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Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECl - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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Annex :

Formulation & (re)packing of substances and mixtures

Use as an intermediate

Industrial use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Industrial use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

Professional use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Service life - workers, Professional use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Professional use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

Service life - workers, Professional use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

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1. Short title of Exposure Scenario: Formulation & (re)packing of substances and mixtures

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental Release Categories	: ERC2: Formulation into mixture
Process categories	: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC28: Manual maintenance (cleaning and repair) of machinery

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation into mixture

Amount used

Daily amount per site	: 104.5 tonnes/day
Annual amount per site	: 23000 tonnes/year

Environment factors not influenced by risk management

Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100

Other given operational conditions affecting environmental exposure

Number of emission days per year	: 220
Emission or Release Factor: Air	: 0.36 %
Emission or Release Factor: Water	: 0 %
Emission or Release Factor: Soil	: 0 %
Remarks	: FEICA SPERC 2.1b.v3

Technical conditions and measures / Organizational measures

Exposure time	: Continuous use/release
Compartment	: Fresh water, Fresh water sediment, Marine water, Marine sediment, Soil, Sewage treatment plant, Air

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Air : (Effectiveness (of a measure): 80 %)

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Flow rate of sewage treatment plant effluent : 2,000 m³/day
Percentage removed from waste water : 87.34 %

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice : No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water, Process optimized for highly efficient use of raw materials., Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste.

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System, Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures, Closed systems, With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day

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Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : General exposures, Use in contained batch processes, With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.5 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Mixing operations (open systems), Batch process, With sample collection, Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

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Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes

Activity : Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC8b, PROC9: Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Activity : Material transfers, Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Technical conditions and measures

(Effectiveness (of a measure): 90 - 95 %)

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.8 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Wear respiratory protection., APF 10
Use suitable eye protection.

3. Exposure estimation and reference to its source

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Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	EUSES v2.1		Fresh water		0.00253 mg/L	< 0.01
			Fresh water sediment		0.0095 mg/kg dry weight	< 0.01
			Marine water		0.000237 mg/L	< 0.01
			Marine sediment		0.000891 mg/kg dry weight	< 0.01
			Sewage treatment plant		0 mg/L	< 0.01
			Soil		0.019 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.043 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA		Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC3	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA		Worker - inhalative, long-term - systemic	2.149 mg/m ³	0.14
			Worker - dermal,	0.343 mg/kg bw/day	0.03

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			long-term - systemic		
PROC5	ECETOC TRA		Worker - inhalative, long-term - systemic	1.29 mg/m ³	0.084
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC8b PROC9	ECETOC TRA		Worker - inhalative, long-term - systemic	9.027 mg/m ³	0.586
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	2.149 mg/m ³	0.14
			Worker - dermal, long-term - systemic	0.017 mg/kg bw/day	< 0.01
PROC8a PROC28	ECETOC TRA		Worker - inhalative, long-term - systemic	3.009 mg/m ³	0.195
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06

ERC2: Formulation into mixture

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC15: Use as laboratory reagent

PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC28: Manual maintenance (cleaning and repair) of machinery

PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC4: Chemical production where opportunity for exposure arises

PROC5: Mixing or blending in batch processes

PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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1. Short title of Exposure Scenario: Use as an intermediate

Main User Groups : SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Environmental Release Categories : ERC6a: Use of intermediate

Process categories : PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4: Chemical production where opportunity for exposure arises
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
PROC28: Manual maintenance (cleaning and repair) of machinery

2.1 Contributing scenario controlling environmental exposure for: ERC6a: Use of intermediate

Amount used

Daily amount per site : 7.67 tonnes/day
Annual amount per site : 23000 tonnes/year
Fraction of Regional tonnage used : 10 %
locally:

Environment factors not influenced by risk management

Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 0.25 %
Emission or Release Factor: Water : 0.02 %
Emission or Release Factor: Soil : 0.001 %
Remarks : SpERC

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Flow rate of sewage treatment : 2,000 m3/day

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plant effluent
Percentage removed from waste water : 87.34 %

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice : Upgrade of the system in place or additional air treatment measures, such as wet scrubber and/or air filtration and/or thermal oxidation and/or vapour recovery systems, in order to achieve a reduction of the air emissions., No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water, Process optimized for highly efficient use of raw materials.

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Activity : General exposures, Closed systems, Continuous process
Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures, Closed systems, With sample collection
Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : General exposures, Use in contained batch processes, With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

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2.5 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : General exposures, Batch process, With sample collection, Open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC8b, PROC9: Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Activity : Material transfers, Dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

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Advanced Occupational Health and Safety Management System

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

(Effectiveness (of a measure): $\geq 95\%$)

Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)

Ensure fixed capturing hood is used.

Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

(Effectiveness (of a measure): $\geq 95\%$)

Use suitable eye protection.

2.8 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : liquid

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Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Wear respiratory protection., APF 10
Use suitable eye protection.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	EUSES v2.1		Fresh water		0.012 mg/L	0.022
			Fresh water sediment		0.046 mg/kg dry weight	< 0.01
			Marine water		0.00121 mg/L	0.022
			Marine sediment		0.00454 mg/kg dry weight	< 0.01
			Sewage treatment plant		0.097 mg/L	0.016
			Soil		0.00375 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.043 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.34 mg/kg bw/day	< 0.01

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PROC2	ECETOC TRA		Worker - inhalative, long-term - systemic	10.47 mg/m ³	0.698
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC3	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA		Worker - inhalative, long-term - systemic	2.149 mg/m ³	0.14
			Worker - dermal, long-term - systemic	0.343 mg/kg bw/day	0.03
PROC8b PROC9	ECETOC TRA		Worker - inhalative, long-term - systemic	9.027 mg/m ³	0.586
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	2.149 mg/m ³	0.14
			Worker - dermal, long-term - systemic	0.017 mg/kg bw/day	< 0.01
PROC8a PROC28	ECETOC TRA		Worker - inhalative, long-term - systemic	3.009 mg/m ³	0.195
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06

ERC6a: Use of intermediate

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC15: Use as laboratory reagent

PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC28: Manual maintenance (cleaning and repair) of machinery

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PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4: Chemical production where opportunity for exposure arises
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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1. Short title of Exposure Scenario: Industrial use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental Release Categories	: ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Process categories	: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC28: Manual maintenance (cleaning and repair) of machinery PROC15: Use as laboratory reagent

2.1 Contributing scenario controlling environmental exposure for: ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)

Amount used

Daily amount per site	: <= 26.13 tonnes/day
Annual amount per site	: <= 5750 tonnes/year

Environment factors not influenced by risk management

Flow rate	: 18,000 m ³ /day
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100

Other given operational conditions affecting environmental exposure

Number of emission days per year	: 220
Emission or Release Factor: Air	: 1.7 %
Emission or Release Factor: Water	: 0 %
Emission or Release Factor: Soil	: 0 %
Remarks	: SpERC

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Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Flow rate of sewage treatment plant effluent : 2,000 m³/day
Percentage removed from waste water : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems), Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems), Closed systems, With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C

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Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : Aerosol, Film formation - air drying - indoor

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.5 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : Preparation of material for application, Closed systems, Mixing operations

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : Injection moulding of articles, Batch process, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

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Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.8 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Injection moulding of articles, Foaming, Open systems, Machines, Manual

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Film formation - air drying, Open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.

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Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.10 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes

Activity : Preparation of material for application, Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.11 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying

Activity : Spraying, Automated task, Manual

Product characteristics

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Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation
Use high-performance fume cupboard.
Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.12 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

Activity : Material transfers, Non-dedicated facility

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)

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Use suitable eye protection.

2.13 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

Activity : Material transfers, Dedicated facility, Drum/batch transfers, Transfer from/pouring from containers

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.14 Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Activity : Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

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Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.15 Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

Activity : Dipping, immersion and pouring
Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.16 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance
Product characteristics
Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.17 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6d	EUSES v2.1		Fresh water		0.00253 mg/L	< 0.01
			Fresh water sediment		0.0095 mg/kg dry weight	< 0.01
			Marine water		0.000237 mg/L	< 0.01
			Marine sediment		0.000891 mg/kg dry weight	< 0.01
			Sewage treatment plant		0 mg/L	< 0.01
			Soil		0.022 mg/kg dry weight	< 0.01

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Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.0086 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.0068 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	General exposures	Worker - inhalative, long-term - systemic	0.86 mg/m ³	0.056
			Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	Aerosol	Worker - inhalative, long-term - systemic	0.86 mg/m ³	0.056
			Worker - dermal, long-term - systemic	0.014 mg/kg dry weight	< 0.01
PROC3	ECETOC TRA	Preparation of material for application	Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.0069 mg/kg bw/day	< 0.01
PROC3	ECETOC TRA	Injection moulding of articles	Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.0069 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Mixing operations (open systems), Preparation of material for application	Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Injection moulding of articles	Worker - inhalative, long-term -	4.299 mg/m ³	0.279

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			systemic		
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Film formation - air drying, Open systems	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC5	ECETOC TRA	Preparation of material for application, Mixing operations (open systems)	Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC7	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.257 mg/kg bw/day	0.023
PROC8a	ECETOC TRA		Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC8b	ECETOC TRA		Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC10	ECETOC TRA		Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC13	ECETOC TRA		Worker - inhalative, long-term -	8.597 mg/m ³	0.558

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			systemic		
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC8a PROC28	ECETOC TRA		Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.0034 mg/kg bw/day	< 0.01

ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC28: Manual maintenance (cleaning and repair) of machinery

PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC4: Chemical production where opportunity for exposure arises

PROC5: Mixing or blending in batch processes

PROC7: Industrial spraying

PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult our Internet site: Downstream Users
www.echa.europa.eu/regulations/reach/downstream-users

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1. Short title of Exposure Scenario: Industrial use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental Release Categories	: ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Process categories	: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC28: Manual maintenance (cleaning and repair) of machinery PROC15: Use as laboratory reagent

2.1 Contributing scenario controlling environmental exposure for: ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)

Amount used

Daily amount per site	: <= 26.13 tonnes/day
Annual amount per site	: <= 5750 tonnes/year

Environment factors not influenced by risk management

Flow rate	: 18,000 m ³ /day
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100

Other given operational conditions affecting environmental exposure

Number of emission days per year	: 220
Emission or Release Factor: Air	: 1.7 %
Emission or Release Factor: Water	: 0 %
Emission or Release Factor: Soil	: 0 %
Remarks	: SpERC

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Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Flow rate of sewage treatment plant effluent : 2,000 m3/day
Percentage removed from waste water : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems), With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

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Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : Injection moulding of articles, Batch process, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): $\geq 95\%$)
Use suitable eye protection.

2.5 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : Film formation - air drying, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

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Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : Preparation of material for application, Mixing operations,
Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Preparation of material for application, Mixing operations
(open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

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Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.8 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Film formation - air drying, Open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes

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Activity : Preparation of material for application, Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): 90 - 95 %)
Ensure fixed capturing hood is used.
Ensure on-tool extraction is used.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.10 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying

Activity : Spraying (automatic/robotic), Manual

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation (Effectiveness (of a measure): >= 95 %)
Use high-performance fume cupboard.
Apply within a vented cab supplied with filtered air under positive pressure and with a protection

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factor of >20.

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

(Effectiveness (of a measure): $\geq 95\%$)

Use suitable eye protection.

2.11 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Temperature : ≤ 40 °C

Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.

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

Use suitable eye protection and gloves.

2.12 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

Activity : Material transfers, Dedicated facility, Drum/batch transfers, Transfer from/pouring from containers

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): ≥ 95 %)
Use suitable eye protection.

2.13 Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Activity : Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): ≥ 95 %)
Use suitable eye protection.

2.14 Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

Activity : Dipping, immersion and pouring

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

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Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.15 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

2.16 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Activity : Laboratory activities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
(Effectiveness (of a measure): >= 95 %)
Use suitable eye protection.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6d	EUSES v2.1		Fresh water		0.00253 mg/L	< 0.01
			Fresh water sediment		0.0095 mg/kg dry weight	< 0.01
			Marine water		0.000237 mg/L	< 0.01
			Marine sediment		0.000891 mg/kg dry weight	< 0.01
			Sewage treatment plant		0 mg/L	< 0.01
			Soil		0.022 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.043 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	General exposures (closed systems), With sample collection	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker -	0.069 mg/kg	< 0.01

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			dermal, long-term - systemic	bw/day	
PROC2	ECETOC TRA	Injection moulding of articles, Batch process	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	Film formation - air drying	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC3	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Preparation of material for application, Mixing operations (open systems)	Worker - inhalative, long-term - systemic	2.149 mg/m ³	0.14
			Worker - dermal, long-term - systemic	0.343 mg/kg bw/day	0.03
PROC4	ECETOC TRA	Film formation - air drying	Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.29
			Worker - dermal, long-term - systemic	0.343	
PROC5	ECETOC TRA		Worker - inhalative, long-term - systemic	1.29 mg/m ³	0.084
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC7	ECETOC TRA		Worker - inhalative, long-term - systemic	9.027 mg/m ³	0.586
			Worker -	2.143 mg/kg	0.188

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			dermal, long-term - systemic	bw/day	
PROC8a	ECETOC TRA		Worker - inhalative, long-term - systemic	7.737 mg/m ³	0.502
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC8b	ECETOC TRA		Worker - inhalative, long-term - systemic	6.448 mg/m ³	0.419
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC10	ECETOC TRA		Worker - inhalative, long-term - systemic	7.737 mg/m ³	0.502
			Worker - dermal, long-term - systemic	1.372 mg/kg bw/day	0.12
PROC13	ECETOC TRA		Worker - inhalative, long-term - systemic	7.737 mg/m ³	0.502
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC8a PROC28	ECETOC TRA		Worker - inhalative, long-term - systemic	7.737 mg/m ³	0.502
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	15.04 mg/m ³	0.977
			Worker - dermal, long-term - systemic	0.017 mg/kg bw/day	< 0.01

ERC6d: Use of reactive process regulators in polymerisation processes at industrial site
(inclusion or not into/onto article)

PROC1: Chemical production or refinery in closed process without likelihood of exposure or
processes with equivalent containment conditions

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PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC28: Manual maintenance (cleaning and repair) of machinery
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4: Chemical production where opportunity for exposure arises
PROC5: Mixing or blending in batch processes
PROC7: Industrial spraying
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult our Internet site: Downstream Users
www.echa.europa.eu/regulations/reach/downstream-users

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1. Short title of Exposure Scenario: Professional use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Main User Groups : SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Environmental Release Categories : ERC8c, ERC8f: Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)

Process categories : PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4: Chemical production where opportunity for exposure arises
PROC5: Mixing or blending in batch processes
PROC11: Non-industrial spraying
PROC19: Manual activities involving hand contact
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC28: Manual maintenance (cleaning and repair) of machinery
PROC15: Use as laboratory reagent

2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f: Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)

Amount used

Daily amount per site : 0.00316 tonnes/day

Environment factors not influenced by risk management

Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0 %
Emission or Release Factor: Water : 1.5 %
Emission or Release Factor: Soil : 0 %
Remarks : FEICA SPERC 8c.3.v3

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Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Effectiveness (of a measure) : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems)

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Advanced Occupational Health and Safety Management System
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems), With sample collection

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : Film formation - air drying, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.5 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : Preparation of material for application, Mixing operations, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

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Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Preparation of material for application, Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Film formation - air drying, Open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): ≥ 90 %)
Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC11: Non-industrial spraying

Activity : Spraying, Manual

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): ≥ 90 %)
Wear respiratory protection., APF 10
Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes

Activity : Preparation of material for application, Open systems, Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day

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Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.10 Contributing scenario controlling worker exposure for: PROC19: Manual activities involving hand contact

Activity : Preparation of material for application, Mixing operations (open systems)

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 1 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.11 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

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Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.12 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.13 Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Activity : Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

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Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.14 Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

Activity : Production of foam-based objects

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.15 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

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Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.16 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Activity : Laboratory activities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
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ERC8c ERC8f	EUSES v2.1		Fresh water		0.00283 mg/L	< 0.01
			Fresh water sediment		0.011 mg/kg dry weight	< 0.01
			Marine water		0.000267 mg/L	< 0.01
			Marine sediment		0.001 mg/kg dry weight	< 0.01
			Sewage treatment plant		0.003 mg/L	< 0.01
			Soil		0.00228 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.086 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.0068 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	General exposures (closed systems), With sample collection	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.027 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA	Film formation - air drying, Closed systems	Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.027 mg/kg bw/day	< 0.01
PROC3	ECETOC TRA		Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.014 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Preparation of material for application, Mixing operations (open systems)	Worker - inhalative, long-term -	3.611 mg/m ³	0.234

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			systemic		
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC4	ECETOC TRA	Film formation - air drying, Open systems	Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC11	ECETOC TRA	Spraying, Manual	Worker - inhalative, long-term - systemic	6.018 mg/m ³	0.391
			Worker - dermal, long-term - systemic	2.143 mg/kg bw/day	0.188
PROC5	ECETOC TRA		Worker - inhalative, long-term - systemic	3.611 mg/m ³	0.234
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC19	ECETOC TRA		Worker - inhalative, long-term - systemic	3.009 mg/m ³	0.195
			Worker - dermal, long-term - systemic	2.829 mg/kg bw/day	0.248
PROC8a	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC8b	ECETOC TRA		Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC10	ECETOC TRA		Worker - inhalative, long-term -	9.027 mg/m ³	0.586

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			systemic Worker - dermal, long-term - systemic	0.549 mg/kg bw/day	0.048
PROC13	ECETOC TRA		Worker - inhalative, long-term - systemic	8.597 mg/m ³	0.558
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC8a PROC28	ECETOC TRA	Equipment cleaning and maintenance	Worker - inhalative, long-term - systemic	9.027 mg/m ³	0.586
			Worker - dermal, long-term - systemic	0.274 mg/kg bw/day	0.024
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	4.299 mg/m ³	0.279
			Worker - dermal, long-term - systemic	0.0068 mg/kg bw/day	< 0.01

ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC10: Roller application or brushing

PROC11: Non-industrial spraying

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

PROC19: Manual activities involving hand contact

PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC28: Manual maintenance (cleaning and repair) of machinery

PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC4: Chemical production where opportunity for exposure arises

PROC5: Mixing or blending in batch processes

PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult our Internet site: Downstream Users
www.echa.europa.eu/regulations/reach/downstream-users

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1. Short title of Exposure Scenario: Service life - workers, Professional use, Use in rigid foams, coatings, adhesives and sealants, Polyurethane

Main User Groups : SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental Release Categories : ERC10a, ERC11a: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor)
Process categories : PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

2.1 Contributing scenario controlling environmental exposure for: ERC10a, ERC11a: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor)

Amount used

Daily amount per site : <= 0.00316 tonnes/day

Environment factors not influenced by risk management

Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.05 %
Emission or Release Factor: Water : 3.2 %
Emission or Release Factor: Soil : 3.2 %

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Effectiveness (of a measure) : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 0.1%.
Physical Form (at time of use) : Solid or article

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

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Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC10a ERC11a	EUSES v2.1		Fresh water		0.00317 mg/L	< 0.01
			Fresh water sediment		0.012 mg/kg dry weight	< 0.01
			Marine water		0.000301 mg/L	< 0.01
			Marine sediment		0.00113 mg/kg dry weight	< 0.01
			Sewage treatment plant		0.0064 mg/L	< 0.01
			Soil		0.00229 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC21	ECETOC TRA		Worker - inhalative, long-term - systemic	0.1 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.283 mg/kg bw/day	0.025

ERC10a: Widespread use of articles with low release (outdoor)

ERC11a: Widespread use of articles with low release (indoor)

PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

For further information, please also consult our Internet site: Downstream Users
www.echa.europa.eu/regulations/reach/downstream-users

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1. Short title of Exposure Scenario: Professional use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

Main User Groups	: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental Release Categories	: ERC8c, ERC8f: Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)
Process categories	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non-industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent PROC19: Manual activities involving hand contact

2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f: Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)

Amount used

Daily amount per site : <= 0.00316 tonnes/day

Environment factors not influenced by risk management

Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0 %
Emission or Release Factor: Water : 1.5 %
Emission or Release Factor: Soil : 0 %
Remarks : FEICA SPERC 8c.3.v3

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard

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Effectiveness (of a measure) : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems)
Product characteristics
Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use
Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure
Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection.

2.3 Contributing scenario controlling worker exposure for: PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Activity : General exposures (closed systems), With sample collection
Product characteristics
Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use
Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure
Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.4 Contributing scenario controlling worker exposure for: PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Activity : Preparation of material for application, Mixing operations, Closed systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.5 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Preparation of material for application, Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 1 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 70 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

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Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.6 Contributing scenario controlling worker exposure for: PROC4: Chemical production where opportunity for exposure arises

Activity : Film formation - air drying, Open systems

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)
Use suitable eye protection.

2.7 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes

Activity : Mixing operations (open systems), Preparation of material for application

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 1 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : ≤ 40 °C
Remarks : Operating temperature

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Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented

Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)

Use suitable eye protection.

2.8 Contributing scenario controlling worker exposure for: PROC11: Non-industrial spraying

Activity : Spraying, Manual

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 25 %.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 4 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Temperature : ≤ 40 °C

Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): $\geq 90\%$)

Wear respiratory protection., APF 20

Use suitable eye protection.

2.9 Contributing scenario controlling worker exposure for: PROC19: Manual activities involving hand contact

Activity : Preparation of material for application, Mixing operations (open systems), Opportunity for aerosol exposure

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 1 h/day

Remarks : Inhalation, Dermal

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation
Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 80 - 90 %)

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Wear respiratory protection., APF 20
Use suitable eye protection.

2.10 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Wear respiratory protection., APF 10
Use suitable eye protection.

2.11 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

Product characteristics

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Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 40 °C
Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Use suitable eye protection.

2.12 Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing

Activity : Roller, spreader, flow application

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.
Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Temperature : <= 70 °C
Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation
Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 80 - 90 %)

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)
Wear respiratory protection., APF 20
Use suitable eye protection.

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2.13 Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

Activity : Dipping, immersion and pouring

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Temperature : <= 70 °C

Remarks : Operating temperature

Technical conditions and measures

Local exhaust ventilation
Provide the operation with a properly sited receiving hood. (Effectiveness (of a measure): 80 - 90 %)

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness (of a measure): >= 90 %)

Wear respiratory protection., APF 10

Use suitable eye protection.

2.14 Contributing scenario controlling worker exposure for: PROC8a, PROC28: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities, Manual maintenance (cleaning and repair) of machinery

Activity : Equipment cleaning and maintenance

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : <= 4 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Temperature : <= 40 °C

Remarks : Operating temperature

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Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): $\geq 90\%$)

Wear respiratory protection., APF 10

Use suitable eye protection.

2.15 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 50%.

Mixture/Article

Physical Form (at time of use) : liquid

Frequency and duration of use

Frequency of use : ≤ 8 h/day

Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Temperature : ≤ 40 °C

Remarks : Operating temperature

Organisational measures to prevent /limit releases, dispersion and exposure

Assumes a good basic standard of occupational hygiene is implemented

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

(Effectiveness (of a measure): $\geq 90\%$)

Use suitable eye protection.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8c ERC8f	EUSES v2.1		Fresh water		0.00283 mg/L	< 0.01
			Fresh water sediment		0.011 mg/kg dry weight	< 0.01
			Marine water		0.000267 mg/L	< 0.01
			Marine sediment		0.001 mg/kg dry weight	< 0.01

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			Sewage treatment plant		0.003 mg/L	< 0.01
			Soil		0.00228 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC1	ECETOC TRA		Worker - inhalative, long-term - systemic	0.43 mg/m ³	0.028
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01
PROC2	ECETOC TRA		Worker - inhalative, long-term - systemic	15.04 mg/m ³	0.977
			Worker - dermal, long-term - systemic	0.137 mg/kg bw/day	0.012
PROC3	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	0.069 mg/kg bw/day	< 0.01
PROC4	ECETOC TRA	Preparation of material for application, Mixing operations (open systems)	Worker - inhalative, long-term - systemic	2.579 mg/m ³	0.167
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC4	ECETOC TRA	Film formation - air drying, Open systems	Worker - inhalative, long-term - systemic	7.737 mg/m ³	0.502
			Worker - dermal, long-term - systemic	0.686 mg/kg bw/day	0.06
PROC5	ECETOC TRA		Worker - inhalative, long-term -	2.579 mg/m ³	0.167

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			systemic		
			Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.12
PROC11	ECETOC TRA	Spraying, Manual	Worker - inhalative, long-term - systemic	5.416 mg/m ³	0.352
			Worker - dermal, long-term - systemic	6.428 mg/kg bw/day	0.564
PROC19	ECETOC TRA		Worker - inhalative, long-term - systemic	3.009 mg/m ³	0.195
			Worker - dermal, long-term - systemic	2.829 mg/kg bw/day	0.248
PROC8a	ECETOC TRA		Worker - inhalative, long-term - systemic	6.448 mg/m ³	0.419
			Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.12
PROC8b	ECETOC TRA		Worker - inhalative, long-term - systemic	12.9 mg/m ³	0.837
			Worker - dermal, long-term - systemic	1.37 mg/kg bw/day	0.12
PROC10	ECETOC TRA		Worker - inhalative, long-term - systemic	12.89 mg/m ³	0.837
			Worker - dermal, long-term - systemic	1.646 mg/kg bw/day	0.144
PROC13	ECETOC TRA		Worker - inhalative, long-term - systemic	9.027 mg/m ³	0.586
			Worker - dermal, long-term - systemic	0.823 mg/kg bw/day	0.072
PROC8a PROC28	ECETOC TRA		Worker - inhalative, long-term -	4.514 mg/m ³	0.293

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			systemic		
			Worker - dermal, long-term - systemic	1.371 mg/kg bw/day	0.12
PROC15	ECETOC TRA		Worker - inhalative, long-term - systemic	15.04 mg/m ³	0.977
			Worker - dermal, long-term - systemic	0.034 mg/kg bw/day	< 0.01

ERC8c: Widespread use leading to inclusion into/onto article (indoor)

ERC8f: Widespread use leading to inclusion into/onto article (outdoor)

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC10: Roller application or brushing

PROC11: Non-industrial spraying

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

PROC19: Manual activities involving hand contact

PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC28: Manual maintenance (cleaning and repair) of machinery

PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC4: Chemical production where opportunity for exposure arises

PROC5: Mixing or blending in batch processes

PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities

PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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1. Short title of Exposure Scenario: Service life - workers, Professional use, Use in rigid foams, coatings, adhesives and sealants, Epoxy curing agent

Main User Groups : SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental Release Categories : ERC10a, ERC11a: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor)
Process categories : PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

2.1 Contributing scenario controlling environmental exposure for: ERC10a, ERC11a: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor)

Amount used

Daily amount per site : <= 0.00316 tonnes/day

Environment factors not influenced by risk management

Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0.05 %
Emission or Release Factor: Water : 3.2 %
Emission or Release Factor: Soil : 3.2 %

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant : Standard
Effectiveness (of a measure) : 87.34 %

2.2 Contributing scenario controlling worker exposure for: PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

Product characteristics

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 0.1%.
Physical Form (at time of use) : Solid or article

Frequency and duration of use

Frequency of use : <= 8 h/day
Remarks : Inhalation, Dermal

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Outdoor / Indoor : Outdoor

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Technical conditions and measures

Assumes a good basic standard of occupational hygiene is implemented
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC10a ERC11a	EUSES v2.1		Fresh water		0.00317 mg/L	< 0.01
			Fresh water sediment		0.012 mg/kg dry weight	< 0.01
			Marine water		0.000301 mg/L	< 0.01
			Marine sediment		0.00113 mg/kg dry weight	< 0.01
			Sewage treatment plant		0.0064 mg/L	< 0.01
			Soil		0.00229 mg/kg dry weight	< 0.01

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR
PROC21	ECETOC TRA		Worker - inhalative, long-term - systemic	0.1 mg/m ³	< 0.01
			Worker - dermal, long-term - systemic	0.283 mg/kg bw/day	0.025

ERC10a: Widespread use of articles with low release (outdoor)

ERC11a: Widespread use of articles with low release (indoor)

PROC21: Low energy manipulation and handling of substances bound in/on materials and/or articles

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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