SAFETY DATA SHEET

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

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

1.1 Product identifier

Product name:
Dynasylan® 1124

Additional identification

Chemical name:	Bis(trimethoxysilylpropyl)amine
Chemical formula:	C12H31NO6Si2
INDEX No.	-
CAS-No.	82985-35-1
EC No.	280-084-5
REACH Registration No.:	01-2119969956-12-0001

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

Identified uses: For industrial use
Coupling agent
Crosslinking agents
Surface modifier

Uses advised against: Not determined.

1.3 Details of the supplier of the safety data sheet

Company Name : Evonik Operations GmbH
Rellinghauser Str. 1-11
45128 Essen
Germany

Telephone : +49 6181 59 4787

E-mail : sds-hu@evonik.com

1.4 Emergency telephone number:

24-Hour Health Emergency : +49 7623 919191

National Poison Information Service (NPIS)
England, Scotland and Wales: NHS: 111

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

The product has been classified according to the legislation in force.

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

Health Hazards

Serious eye damage	Category 1	H318: Causes serious eye damage.

2.2 Label Elements

Signal Words: Danger

Hazard Statement(s): H318: Causes serious eye damage.

Precautionary Statements

Prevention: P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response: P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/ physician.

2.3 Other hazards

PBT/vPvB data
Not a PBT, vPvB substance as per the criteria of the REACH Regulation.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name: Bis(trimethoxysilylpropyl)amine
INDEX No.:
CAS-No.: 82985-35-1
EC No.: 280-084-5
REACH Registration No.: 01-2119969956-12-0001

Chemical name	Concentration	CAS-No.	EC No.	UK-REACH Registration No.	REACH Registration No.	M-Factor:	Notes
Bis(trimethoxysilylpropyl)amine		82985-35-1	280-084-5	-	01-2119969956-12	No data available.	
methanol	<0.3%	67-56-1	200-659-6	-	01-2119433307-44	No data available.	#

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
# This substance has workplace exposure limit(s).
This substance is listed as SVHC.

Classification

Chemical name	Classification	Notes
Bis(trimethoxysilylpropyl)amine	Classification: Eye Dam.: 1: H318; Supplemental label information: None known.	None.
methanol	Classification: Flam. Liq.: 2: H225; Acute Tox.: 3: H301; Acute Tox.: 3: H311; Acute Tox.: 3: H331; STOT SE: 1: H370; Supplemental label information: None known.	None.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information: Immediately remove contaminated clothing.

Inhalation: If aerosol or mists are formed: Move to fresh air. Get medical attention if any discomfort continues.

Skin Contact: Wash off immediately with plenty of water. If skin irritation persists, call a physician.

Eye contact: With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes. Continue rinsing process with eye rinsing solution. Protect unharmed eye. Call ambulance. (Cue: caustic burn of the eyes) Immediate further treatment in eye clinic/by eye doctor. continue rinsing eye until arrival at ophthalmic hospital.

Ingestion: Have the mouth rinsed with water. Only when patient fully conscious: Have patient drink plenty of water in small sips. Get medical attention immediately.

Personal Protection for First-aid Responders: No data available.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: After absorbing large amounts of substance: Liberation of reaction products (Methanol) can lead to symptoms of poisoning. Possible signs of poisoning: daze, dizziness, nausea, colicky abdominal pain, respiratory disturbance. Symptoms upon increasing intoxication: dysopia, loss of eyesight.

Hazards: None known.

4.3 Indication of immediate medical attention and special treatment needed

Treatment: If required, therapy of irritative effect. Treatment Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, aspirate leftover substance. Detection of substance (Methanol) possible in: Blood Antidote treatment: ethanol.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:	Water spray, foam, dry powder or carbon dioxide.
Unsuitable extinguishing media:	High volume water jet.
5.2 Special hazards arising from the substance or mixture:	Hazardous fumes in fires, specific to the product: Nitrogen Oxides

5.3 Advice for firefighters

Special fire fighting procedures:	Water used to extinguish fire should not enter drainage systems, soil or stretches of water. Ensure there are sufficient retaining facilities for water used to extinguish fire. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters:	In case of fire: wear a self contained respiratory apparatus

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:	Use personal protective equipment. Avoid contact with skin and eyes.
6.1.1 For non-emergency personnel:	No data available.
6.1.2 For emergency responders:	No data available.
6.2 Environmental Precautions:	Do not allow entrance in sewage water, soil stretches of water, groundwater, drainage systems.
6.3 Methods and material for containment and cleaning up:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Fill into marked, sealable containers. To be disposed of in compliance with existing regulations.
6.4 Reference to other sections:	For personal protection see section 8. For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures:	No data available.
Local/Total ventilation:	Provide for good ventilation if vapours/aerosols are formed.
Safe handling advice:	Provide good ventilation or extraction. Handle in accordance with good industrial hygiene and safety practice.Handle in accordance with good industrial hygiene and safety practice. The personal protective equipment used must meet the requirements of Regulation (EU) 2016/425 and amendments (CE certification). If workplace exposure limits are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used. If there is the possibility of skin/eye contact, the indicated

hand/eye/body protection should be used. Do not breathe in vapours or aerosols. Avoid contact with skin and eyes.

Contact avoidance measures: No data available.

7.2 Conditions for safe storage, including any incompatibilities

Safe storage conditions: The product has an intermediate conductivity (static conductivity 100-10,000 pS/m) Liquids with a low conductivity (static conductivity < 100 pS/m) or intermediate conductivities (static conductivity 100 pS/m - 10,000 pS/m) might become electrostatically charged and thus present potential sources ignition. Germany: Technical Rules for Hazardous Substances - Prevention of the Risk of Ignition as a Result of Electrostatic Charges EU: NFPA 77, Recommended Practice on Static Electricity Normal measures for preventive fire protection.Keep containers tightly closed in a cool, well-ventilated place. Protect from moisture.

Safe packaging materials: No data available.

7.3 Specific end use(s):

For more details see annexes Exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	Type	Form of exposure	Exposure Limit Values		Source
methanol	TWA		200 ppm	266 mg/m3	EH40 WEL (12 2011)
	STEL 15 minutes		250 ppm	333 mg/m3	EH40 WEL (01 2020)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Biological Limit Values

No biological exposure limits noted for the ingredient(s).

DNEL-Values

Critical component	Type	Route of Exposure	Health Warnings	Remarks
Bis(trimethoxysilylpropyl)amine	General population	Inhalation	Systemic, long-term; 50 mg/m3	Acute toxicity
	Workers	Inhalation	Local, short-term; 260 mg/m3	Acute toxicity
	General population	Inhalation	Systemic, short-term; 50 mg/m3	Acute toxicity
	Workers	Inhalation	Local, long-term; 260 mg/m3	Acute toxicity
	Workers	Inhalation	Systemic, long-term; 260 mg/m3	Acute toxicity
	General population	Inhalation	Local, long-term; 50 mg/m3	Acute toxicity
	Workers	Inhalation	Systemic, short-term; 260 mg/m3	Acute toxicity
	General population	Inhalation	Local, short-term; 50 mg/m3	Acute toxicity
	Workers	Eyes	Local effect;	Medium hazard (no threshold derived)
	Workers	Dermal	Systemic, long-term; 4.67 mg/kg	Repeated dose toxicity

	General population	Oral	Systemic, long-term; 1.67 mg/kg	Repeated dose toxicity
	General population	Dermal	Systemic, long-term; 1.67 mg/kg	Repeated dose toxicity
	General population	Inhalation	Systemic, long-term; 5.8 mg/m3	Repeated dose toxicity
	Workers	Inhalation	Systemic, long-term; 32.91 mg/m3	Repeated dose toxicity
	Workers	Eyes	Local effect;	No hazard identified
	General population	Eyes	Local effect;	Medium hazard (no threshold derived)
	General population	Eyes	Local effect;	No hazard identified
methanol	Workers	Dermal	Systemic, short-term; 20 mg/kg	Acute toxicity
	General population	Inhalation	Local, short-term; 26 mg/m3	Acute toxicity
	General population	Inhalation	Systemic, short-term; 26 mg/m3	Acute toxicity
	General population	Dermal	Systemic, long-term; 4 mg/kg	Acute toxicity
	General population	Dermal	Systemic, short-term; 4 mg/kg	Acute toxicity
	Workers	Inhalation	Systemic, short-term; 130 mg/m3	Acute toxicity
	General population	Inhalation	Systemic, long-term; 26 mg/m3	Acute toxicity
	Workers	Eyes	Local effect;	No hazard identified
	Workers	Dermal	Systemic, long-term; 20 mg/kg	Acute toxicity
	General population	Oral	Systemic, short-term; 4 mg/kg	Acute toxicity
	Workers	Inhalation	Local, short-term; 130 mg/m3	Acute toxicity
	Workers	Inhalation	Systemic, long-term; 130 mg/m3	Acute toxicity
	General population	Inhalation	Local, long-term; 26 mg/m3	Acute toxicity
	General population	Eyes	Local effect;	No hazard identified
	General population	Oral	Systemic, long-term; 4 mg/kg	Acute toxicity
	Workers	Inhalation	Local, long-term; 130 mg/m3	Acute toxicity

PNEC-Values

Critical component	Environmental compartment	PNEC-Values	Remarks
Bis(trimethoxysilylpropyl)amine	Sediment (marine water)	0.014 mg/kg	
	Sediment (freshwater)	0.14 mg/kg	
	Aquatic (freshwater)	0.036 mg/l	
	Soil	0.007 mg/kg	Soil
	Sediment (marine water)	0.014 mg/kg	
	Sewage treatment plant	27 mg/l	

8.2 Exposure controls

Appropriate Engineering Controls: Provide for good ventilation if vapours/aerosols are formed.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection: close-fitting protective goggles (e.g. closed goggles)

Hand Protection:	Material: Butyl rubber. Break-through time: >= 480 min Glove thickness: 0.5 mm Material: Fluorinated rubber (Viton) Break-through time: >= 480 min Glove thickness: 0.4 mm Additional Information: Selection of protective gloves to meet the requirements of specific workplaces., The suitability for a specific workplace should be discussed with the producers of the protective gloves., The information is based on our own tests, references from the literature and information from glove manufacturers, or derived by analogy with similar materials., Be aware that in daily use the durability of a chemical resistant protective glove can be notably shorter than the break through time measured according to EN 374, due to the numerous outside influences (e.g. temperature).
Skin and Body Protection:	No data available.
Respiratory Protection:	In case of dusts/vapours/aerosols being formed or if the limit values like TLV are exceeded: use respiratory equipment with suitable filter (filter type ABEK) or wear a self contained respiratory apparatus Use only respiratory protection equipment with CE-symbol including four digit test number. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used. Note time limit for wearing respiratory protective equipment.
Hygiene measures:	When using, do not eat, drink or smoke. Wash face and/or hands before break and end of work. Immediately remove contaminated clothing. Wash contaminated clothing before reuse.
Environmental Controls:	see section 6.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state:	liquid
Form:	liquid
Color:	colorless to yellow
Odor:	amine-like
Odor Threshold:	No data available.
Freezing point:	< -38.0 °C Method: ISO 3841
Boiling Point:	285.0 - 288.0 °C at 1,013 hPa Method: ASTM D-1120
Flammability:	not flammable

Upper/lower limit on flammability or explosive limits

Explosive limit - upper:	No data available.

Explosive limit - lower:	No data available.
Flash Point:	> 100 °C Method: DIN EN ISO 2719
Auto-ignition temperature:	270 °C Method: DIN 51794
Decomposition Temperature:	No data available.
pH:	No data available.
Viscosity	
Dynamic viscosity:	6.5 mPa.s at 20 °C Method: DIN 53015
Kinematic viscosity:	5.7 mm2/s at 20 °C
Solubility(ies)	
Solubility in Water:	decomposition by hydrolysis
Partition coefficient (n-octanol/water):	No data available.
Vapor pressure:	0.1 hPa at 20 °C Method: ASTM D 2879-86
Relative density:	No data available.
Density:	1.04 g/cm3 at 20 °C Method: DIN 51757
Relative vapor density:	No data available.

9.2 Other information

Explosive properties:	Not explosive
Self-ignition:	270 °C 998.3 - 1,019.0 hPa Method: EEC method 92/69/EEC, A 15
Peroxides:	Not applicable

SECTION 10: Stability and reactivity

10.1	**Reactivity:**	No dangerous reaction known under conditions of normal use.
10.2	**Chemical Stability:**	Stable under recommended storage conditions.
10.3	**Possibility of hazardous reactions:**	No dangerous reactions known.
10.4	**Conditions to avoid:**	Protect from moisture.
10.5	**Incompatible Materials:**	Alcohols. Alkalies. Acids. humid air and water
10.6	**Hazardous Decomposition Products:**	Methanol in case of hydrolysis. Alcohol formed by hydrolysis lowers the flash point of the product.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of exposure

Inhalation: Information on effects are given below.

Skin Contact: Information on effects are given below.

Eye contact: Information on effects are given below.

Ingestion: Information on effects are given below.

Acute toxicity (list all possible routes of exposure)

Oral

Product:	LD 50, Rat, Female, Male, > 2,000 mg/kg, OECD 401, Not toxic after single exposure
Components:	
Bis(trimethoxysilylpropyl) amine	LD 50, Rat, Female, Male, > 2,000 mg/kg, OECD 401 Not toxic after single exposure, No classification
methanol	LD 50, Rat, 100 mg/kg

Dermal

Product:	LD 50, Rabbit, Male, 16,800 mg/kg, OECD 402 LD 50, Rabbit, Female, 11,865 mg/kg, OECD 402
Components:	
Bis(trimethoxysilylpropyl) amine	LD 50, Rabbit, Male, 16,800 mg/kg, OECD 402 LD 50, Rabbit, Female, 11,865 mg/kg, OECD 402
methanol	LD 50, Rat, 300 mg/kg

Inhalation

Product:	Not classified for acute toxicity based on available data.
Components:	
Bis(trimethoxysilylpropyl) amine	Dust and mist, Not toxic after single exposure, No data available. Vapour, Not toxic after single exposure, No data available.
methanol	LC 50, Acute toxicity estimate, 4 h, 3 mg/l, Vapour LC 50, Acute toxicity estimate, 4 h, > 0.5 mg/l, Dust and mist

Repeated dose toxicity

Product:	NOAEL Rat, Female, Male, Oral, 28 day, 7 days a week, 1,000 mg/kg
Components:	
Bis(trimethoxysilylpropyl) amine	NOAEL Rat, Female, Male, Oral, 28 day, 7 days a week, 1,000 mg/kg
methanol	No data available.

Skin Corrosion/Irritation

Product:	Not irritating, OECD 404, (Rabbit)
Components:	
Bis(trimethoxysilylpropyl)amine	Not irritating, OECD 404, Rabbit
methanol	Not irritating, Rabbit, Literature

Serious Eye Damage/Eye Irritation

Product:	Risk of serious damage to eyes., OECD 405, Rabbit
Components:	
Bis(trimethoxysilylpropyl)amine	Risk of serious damage to eyes., OECD 405, Rabbit
methanol	Not irritating, Rabbit

Respiratory or Skin Sensitization

Product:	Maximization Test, OECD 406, Guinea Pig, Not a skin sensitizer.
Components:	
Bis(trimethoxysilylpropyl)amine	Maximization Test, OECD 406, Guinea Pig, Not a skin sensitizer.
methanol	Maximization Test, OECD 406, Guinea Pig, Not a skin sensitizer.

Carcinogenicity

Product:	No evidence that cancer may be caused.
Components:	
Bis(trimethoxysilylpropyl)amine	No evidence that cancer may be caused.
methanol	Not classified

Germ Cell Mutagenicity

In vitro

Product:	gene mutation test, OECD 471: , negative Chromosomal aberration, OECD 473: , negative
Components:	
Bis(trimethoxysilylpropyl)amine	gene mutation test, OECD 471: , negative Chromosomal aberration, OECD 473: , negative
methanol	Ames test, OECD 471: , negative gene mutation test, OECD 476: , negative Micronucleus test: , negative

In vivo

Product:	Micronucleus test, OECD 474, Intraperitoneal, Mouse, Female, Male, negative
Components:	
Bis(trimethoxysilylpropyl)amine	Micronucleus test, OECD 474, Intraperitoneal, Mouse, Female, Male, negative
methanol	Micronucleus test, OECD 474, Intraperitoneal, Mouse, Female, Male, negative Chromosomal aberration, Intraperitoneal, Mouse, Female, Male, negative

Reproductive toxicity

Product:	No evidence of effects of reprodutive / developmental toxicity.
Components:	
Bis(trimethoxysilylpropyl)amine	No evidence of effects of reprodutive / developmental toxicity.
methanol	Not classified

Specific Target Organ Toxicity - Single Exposure

Product:	No data available.
Components:	
Bis(trimethoxysilylpropyl)amine	No data available.
methanol	Dermal Oral Inhalation - vapor, optic nerve, Central nervous system., Category 1 Causes damage to organs.

Specific Target Organ Toxicity - Repeated Exposure

Product:	No data available.
Components:	

Bis(trimethoxysilylpropyl)amine	No data available.
methanol	No data available.

Aspiration Hazard

Product:	No evidence of aspiration toxicity
Components:	
Bis(trimethoxysilylpropyl)amine	Not classified
methanol	Not classified

11.2 Information on other hazards

Other information

Product:	No data available.

SECTION 12: Ecological information

12.1 Toxicity:

Acute hazards to the aquatic environment:

Fish

Product:	LC 50, Oncorhynchus mykiss, 96 h, 130 mg/l OECD 203
Components:	
Bis(trimethoxysilylpropyl)amine	LC 50, Oncorhynchus mykiss, 96 h, 130 mg/l OECD 203
methanol	LC 50, Bluegill Sunfish, 96 h, 15,400 mg/l US-EPA-method, Literature

Aquatic Invertebrates

Product:	EC 50, Daphnia magna, 48 h, > 100 mg/l OECD 202
Components:	
Bis(trimethoxysilylpropyl)amine	EC 50, Daphnia magna, 48 h, > 100 mg/l OECD 202
methanol	EC 50, Daphnia magna, 96 h, 18,260 mg/l OECD 202, Literature

Toxicity to Aquatic Plants

Product:	EC 50 (Desmodesmus subspicatus (green algae), 72 h): > 100 mg/l (OECD 201)
Components:	
Bis(trimethoxysilylpropyl)amine	EC 50 (Desmodesmus subspicatus (green algae), 72 h): > 100 mg/l (OECD 201)
methanol	EC 50 (Selenastrum capricornutum (green algae), 96 h): Approximate 22,000 mg/l (OECD 201) Literature

Toxicity to microorganisms

Product:	EC 50, local activated sludge, 3 h, 1,000 mg/l, OECD 209
Components:	
Bis(trimethoxysilylpropyl)amine	EC 50, local activated sludge, 3 h, 1,000 mg/l, OECD 209
methanol	EC 50, activated sludge, 3 h, > 1,000 mg/l, OECD 209, Literature

Chronic hazards to the aquatic environment:

Fish

Product:	No data available.

Components:

Bis(trimethoxysilylpropyl) amine	No data available.
methanol	No data available.

Aquatic Invertebrates

Product:	No data available.
Components:	
Bis(trimethoxysilylpropyl) amine	No data available.
methanol	No data available.

Toxicity to Aquatic Plants

Product:	No data available.
Components:	
Bis(trimethoxysilylpropyl) amine	No data available.
methanol	No data available.

Toxicity to microorganisms

Product:	EC 50, local activated sludge, 3 h, 1,000 mg/l, OECD 209
Components:	
Bis(trimethoxysilylpropyl) amine	EC 50, local activated sludge, 3 h, 1,000 mg/l, OECD 209
methanol	EC 50, activated sludge, 3 h, > 1,000 mg/l, OECD 209, Literature

12.2 Persistence and Degradability

Biodegradation

Product:	11 - 20 %, 28 d, OECD 301 D, Not readily degradable.
Components:	
Bis(trimethoxysilylpropyl)amine	11 - 20 %, 28 d, OECD 301 D, Not readily degradable.
methanol	98 %, 28 d, (DOC; modif. OECD screening test / OECD 301 E), Own study The product is easily biodegradable., aerobic

12.3 Bioaccumulative potential

Bioconcentration Factor (BCF)

Product:	not bioaccumulative
Components:	
Bis(trimethoxysilylpropyl)amine	not bioaccumulative
methanol	Leuciscus idus (Golden orfe), < 10, Measured, No significant bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product:	No data available.
Components:	
Bis(trimethoxysilylpropyl)amine	No data available.
methanol	-0.77

12.4 Mobility in soil:

Product	Adsorption on the floor: low.
Components:	
Bis(trimethoxysilylpropyl)amine	Adsorption on the floor: low.

methanol	soil - Log Koc: 1 calculated) Not expected to adsorb on soil.

12.5 Results of PBT and vPvB assessment:

Product	Not a PBT, vPvB substance as per the criteria of the REACH Regulation.
Components:	
Bis(trimethoxysilylpropyl)ami	Non-classified vPvB substance,
ne	Non-classified PBT substance
methanol	Non-classified vPvB substance,
	Non-classified PBT substance

12.6 Other adverse effects:

Other hazards

Product: The data we have at our disposal do not necessitate identification concerning environmental hazard.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information: No data available.

Disposal methods: With respect to local regulations, e.g. dispose of to suitable waste incineration plant. No waste key number as per the European Waste Types List can be assigned to this product, since such classification is based on the (as yet undetermined) use to which the product is put by the consumer. The waste key number must be determined as per the European Waste Types List (decision on EU Waste Types List 2000/532/EC) in cooperation with the disposal firm / producing firm / official authority.

Contaminated Packaging: Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities. If there is product residue in the emptied container, follow directions for handling on the container's label. Incorrect disposal or reuse of this container is illegal and can be dangerous. Other countries: observe the national regulations.

SECTION 14: Transport information

14.1 UN/ID No.

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

UK. REACH, Annex XIV, Substances Subject to Authorization (Authorization List), as amended: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

UK. UK REACH Candidate List of substances of very high concern (SVHCs) for Authorisation: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

Regulation 1005/2009/EC on substances that deplete the ozone layer, Annex I, Controlled Substances: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

Regulation 1005/2009/EC on substances that deplete the ozone layer, Annex II, New Substances: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

UK EXP1: UK. GB PIC List, Regulation (EU) 649/2012 as amended by EU Exit Regulations S.I. 2019/720 and S.I. 2020/1567, as amended: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

UK EXP2: UK. GB PIC List, Regulation (EU) 649/2012 as amended by EU Exit Regulations S.I. 2019/720 and S.I. 2020/1567, as amended: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

UK EXP3: UK. GB PIC List, Regulation (EU) 649/2012 as amended by EU Exit Regulations S.I. 2019/720 and S.I. 2020/1567, as amended: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

UK BAN: UK. GB PIC List, Regulation (EU) 649/2012 as amended by EU Exit Regulations S.I. 2019/720 and S.I. 2020/1567, as amended: None present or none present in regulated quantities (on the basis of current knowledge of the product composition).

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I:

15.2 Chemical safety assessment: Chemical Safety Assessment has been carried out.

International regulations

Montreal protocol
Not applicable

Stockholm convention
Not applicable

Rotterdam convention
Not applicable

Kyoto protocol
Not applicable

SECTION 16: Other information

Abbreviations and acronyms:

EH40 WEL:	UK. EH40 Workplace Exposure Limits (WELs), as amended
EH40 WEL / STEL:	Short Term Exposure Limit (STEL):
EH40 WEL / TWA:	Time Weighted Average (TWA):

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - 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; EIGA - European Industrial Gases Association; 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 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; TECI - 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

Key literature references and sources for data: No data available.

Training information: No data available.

Revision Information Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Disclaimer: This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.

Annex to the extended Safety Data Sheet (eSDS)

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Exposure Scenario I.

Exposure scenario worker

1.Manufacture and use as intermediate, On site

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Product categories [PC]:	PC19: Intermediate (precursor)

Name of contributing environmental scenario and corresponding ERC	<u>Manufacture and use as intermediate:</u> ERC1: Manufacture of the substance ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

	ERC6c: Industrial use of monomers for manufacture of thermoplastics

List of names of contributing worker scenarios and corresponding PROCs	Manufacture and use as intermediate: PROC1: Use in closed process, no likelihood of exposure Manufacture and use as intermediate: PROC2: Use in closed, continuous process with occasional controlled exposure Manufacture and use as intermediate: PROC3: Use in closed batch process (synthesis or formulation) Manufacture and use as intermediate: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Manufacture and use as intermediate: PROC5: Mixing or blending in batch processes Manufacture and use as intermediate: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Manufacture and use as intermediate: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Manufacture and use as intermediate: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2.1.Contributing exposure scenario controlling environmental exposure for: Manufacture and use as intermediate, On site

Environmental Release Category (ERC)	ERC1 ERC6a ERC6c: Manufacture of the substance Industrial use resulting in manufacture of another substance (use of intermediates) Industrial use of monomers for manufacture of thermoplastics

Product characteristics	
Concentration of the substance in a mixture:	Covers percentage substance in the product up to 100 %.

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)

Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	10 tonnes/day
Annual amount per site	999 t(onnes)/year
Fraction tonnage per region	100 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	900
Local marine water dilution factor	2,540

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	99	0.00018 %	-	0.001 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment, Exhaust air scrubber, All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.
Soil	The expected exposure level is minimal., Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m³/d):	
type:	sewage treatment plant
Discharge rate:	1,300 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC1: Use in closed process, no likelihood of exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation		
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC5: Mixing or blending in batch processes

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.9. Contributing exposure scenario controlling worker exposure for: Manufacture and use as intermediate, On site

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	
	Dermal	All equipments must be thoroughly dried, and enclosed to prevent contact with atmospheric moisture., Prevent leakage or spillage.		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented., Process safety assessment, General standard operating procedures to control routine activities, General Permit to Work (PTW) for cleaning and maintenance activities, Flush, purge and vent vessel lines before cleaning or maintenance., Plant integrity checks, Integrated safety management systems, Substance-handling procedures are well documented and strictly supervised by the site operator	
	Dermal	Operator monitoring, Safety and environmental audits	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Manufacture and use as intermediate, On site:

ERC1, ERC6a, ERC6c:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000616 mg/l	0.00308	EUSES v2.1.2	none

freshwater sediment	0.000484 mg/kg wet weight	0.00309	EUSES v2.1.2	none
marine water	0.0000768 mg/l	0.00384	EUSES v2.1.2	none
Marine sediments	0.0000603 mg/kg wet weight	0.00385	EUSES v2.1.2	none
soil	0.000145 mg/kg wet weight	0.00632	EUSES v2.1.2	none
Sewage treatment plant	0.0582 mg/l	0.00265	EUSES v2.1.2	none
Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Manufacture and use as intermediate, On site:

PROC1:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.142 mg/m³	0.00468	ECETOC TRA v3 (2012)	> 4 hours
Worker - dermal, long-term - systemic	indoor	0.0343 mg/kg bw/day	0.00795	ECETOC TRA v3 (2012)	> 4 hours

Manufacture and use as intermediate, On site:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Manufacture and use as intermediate, On site:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	4.27 mg/m³	0.140	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00686 mg/kg bw/day	0.00159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Manufacture and use as intermediate, On site:

PROC4:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Manufacture and use as intermediate, On site:

PROC5:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Manufacture and use as intermediate, On site:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Manufacture and use as intermediate, On site:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Manufacture and use as intermediate, On site:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario II.

Exposure scenario worker

1.Use as monomer at downstream industrial site

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Product categories [PC]:	PC19: Intermediate (precursor)

Name of contributing environmental scenario and corresponding ERC	Use as monomer at downstream industrial site: ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6c: Industrial use of monomers for manufacture of thermoplastics

List of names of contributing worker scenarios and corresponding PROCs	Use as monomer at downstream industrial site: PROC1: Use in closed process, no likelihood of exposure Use as monomer at downstream industrial site: PROC2: Use in closed, continuous process with occasional controlled exposure Use as monomer at downstream industrial site: PROC3: Use in closed batch process (synthesis or formulation) Use as monomer at downstream industrial site:

	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Use as monomer at downstream industrial site: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use as monomer at downstream industrial site: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2.1.Contributing exposure scenario controlling environmental exposure for: Use as monomer at downstream industrial site

Environmental Release Category (ERC)	ERC6a ERC6c: Industrial use resulting in manufacture of another substance (use of intermediates) Industrial use of monomers for manufacture of thermoplastics

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	5 tonnes/day
Annual amount per site	500 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	40
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	100	0.00036 %	-	0.7 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment, Exhaust air scrubber
Soil	The expected exposure level is minimal., Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	10,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

Process Categories:	PROC1: Use in closed process, no likelihood of exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Use as monomer at downstream industrial site

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Use as monomer at downstream industrial site:

ERC6a, ERC6c:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.0334 mg/l	0.167	EUSES v2.1.2	none
freshwater sediment	0.0262 mg/kg wet weight	0.167	EUSES v2.1.2	none
marine water	0.0132 mg/l	0.659	EUSES v2.1.2	none
Marine sediments	0.0103 mg/kg wet weight	0.661	EUSES v2.1.2	none

soil	0.000188 mg/kg wet weight	0.00821	EUSES v2.1.2	none
Sewage treatment plant	1.31 mg/l	0.0597	EUSES v2.1.2	none
Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Use as monomer at downstream industrial site:

PROC1:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.142 mg/m³	0.00468	ECETOC TRA v3 (2012)	> 4 hours
Worker - dermal, long-term - systemic	indoor	0.0343 mg/kg bw/day	0.00795	ECETOC TRA v3 (2012)	> 4 hours

Use as monomer at downstream industrial site:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Use as monomer at downstream industrial site:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	4.27 mg/m³	0.140	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00686 mg/kg bw/day	0.00159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Use as monomer at downstream industrial site:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Use as monomer at downstream industrial site:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Use as monomer at downstream industrial site:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool (“scaling tool”), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario III.

Exposure scenario worker

1.Formulation of sealants

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19: Building and construction work

Product categories [PC]:	PC1: Adhesives, sealants

Name of contributing environmental scenario and corresponding ERC	Formulation of sealants: ERC2: Formulation of preparations

List of names of contributing worker scenarios and corresponding PROCs	Formulation of sealants: PROC2: Use in closed, continuous process with occasional controlled exposure Formulation of sealants: PROC3: Use in closed batch process (synthesis or formulation) Formulation of sealants: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Formulation of sealants: PROC5: Mixing or blending in batch processes Formulation of sealants: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Formulation of sealants: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Formulation of sealants: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2.1.Contributing exposure scenario controlling environmental exposure for: Formulation of sealants

Environmental Release Category (ERC)	ERC2: Formulation of preparations

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	2 tonnes/day
Annual amount per site	400 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	200	2.5 %	-	0.325 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m³/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC5: Mixing or blending in batch processes

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Formulation of sealants

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Formulation of sealants:

ERC2:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.0981 mg/l	0.49	EUSES v2.1.2	none
freshwater sediment	0.0769 mg/kg wet weight	0.491	EUSES v2.1.2	none
marine water	0.0098 mg/l	0.49	EUSES v2.1.2	none
Marine sediments	0.00769 mg/kg wet weight	0.491	EUSES v2.1.2	none

soil	0.0205 mg/kg wet weight	0.895	EUSES v2.1.2	none
Sewage treatment plant	0.975 mg/l	0.0443	EUSES v2.1.2	none

Health:

Formulation of sealants:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.285 mg/m³	0.00936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00274 mg/kg bw/day	0.000636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of sealants:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.854 mg/m³	0.0281	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00137 mg/kg bw/day	0.000318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of sealants:

PROC4:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of sealants:

PROC5:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of sealants:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of sealants:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Formulation of sealants:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario IV.

Exposure scenario worker

1.Industrial use of sealants

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19: Building and construction work
Product categories [PC]:	PC1: Adhesives, sealants

Name of contributing environmental scenario and corresponding ERC	Industrial use of sealants: ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6c: Industrial use of monomers for manufacture of thermoplastics

List of names of contributing worker scenarios and corresponding PROCs	Industrial use of sealants: PROC7: Industrial spraying Industrial use of sealants: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Industrial use of sealants: PROC10: Roller application or brushing Industrial use of sealants: : Treatment of articles by dipping and pouring Industrial use of sealants: PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation Industrial use of sealants: PROC19: Hand-mixing with intimate contact and only PPE available Industrial use of sealants: PROC21: Low energy manipulation of substances bound in materials and/or articles

2.1.Contributing exposure scenario controlling environmental exposure for: Industrial use of sealants

Environmental Release Category (ERC)	ERC5 ERC6c: Industrial use resulting in inclusion into or onto a matrix Industrial use of monomers for manufacture of thermoplastics

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	1 tonnes/day
Annual amount per site	100 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	100	0.1 %	-	0 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	No release to waste water, Prevent substance from entering water.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:
none

Conditions and measures related to sewage treatment plant	
Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste
This information is not available.

Additional good practice advice beyond the REACH CSA
This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC7: Industrial spraying

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	**Frequency of use:**	**Remarks**
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1500 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	**Room size:**	**Temperature :**	**Ventilation rate**	**Remarks**
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	**Route of Exposure**	**Protective Measures**	**Effectiveness**	**Remarks**
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC10: Roller application or brushing

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	: Treatment of articles by dipping and pouring

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC19: Hand-mixing with intimate contact and only PPE available

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1980 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Industrial use of sealants

Process Categories:	PROC21: Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Concentration of the substance in a mixture:	

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

This information is not available.

Human factors not influenced by risk management

This information is not available.

Other given operational conditions affecting workers exposure

Other relevant operational conditions:	PROC21: . On account of the low vapor pressure it is unlikely that the exposure will exceed the already quantified PROCs.

Risk management measures (RMM)

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Industrial use of sealants:

ERC5, ERC6c:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none
marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none
soil	0.000245 mg/kg wet weight	0.0107	EUSES v2.1.2	none
Sewage treatment plant	0 mg/l	0	EUSES v2.1.2	none
Air	0.0000114 mg/m³	0.1	EUSES v2.1.2	none

Health:

Industrial use of sealants:

PROC7:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0429 mg/kg bw/day	0.00994	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Industrial use of sealants:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.712 mg/m³	0.0234	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Industrial use of sealants:

PROC10:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.549 mg/kg bw/day	0.127	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of sealants:

:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of sealants:

PROC14:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00686 mg/kg bw/day	0.00159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of sealants:

PROC19:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	2.82 mg/kg bw/day	0.656	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of sealants:

PROC21:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic			0		not to be determined
Worker - dermal, long-term - systemic			0		not to be determined

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario V.

Exposure scenario worker

1.Professional and consumer use of sealants

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Product categories [PC]:	PC1: Adhesives, sealants

Name of contributing environmental scenario and corresponding ERC	Professional and consumer use of sealants: ERC8b: Wide dispersive indoor use of reactive substances in open systems 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

List of names of contributing worker scenarios and corresponding PROCs	Professional and consumer use of sealants: PROC10: Roller application or brushing : Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available

2.1.Contributing exposure scenario controlling environmental exposure for: Professional and consumer use of sealants

Environmental Release Category (ERC)	ERC8b ERC8c ERC8f: Wide dispersive indoor use of reactive substances in open systems Wide dispersive indoor use resulting in inclusion into or onto a matrix Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	0.0027 tonnes/day
Annual amount per site	1 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	**Emission days**	**Emission factors**			**Remarks**
		Air	**Soil**	**Water**	

Continuous	365	0 %	-	0 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	No waste air is generated.
Soil	The expected exposure level is minimal.
Water	No release to waste water, Prevent substance from entering water.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	Not applicable
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA
This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Professional and consumer use of sealants

Process Categories:	PROC10: Roller application or brushing : Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available

Product characteristics	
Concentration of the substance in a mixture:	Covers percentage substance in the product up to 5%.

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used	
Amount per use	20 kg

Frequency and duration of use			
	Use duration:	**Frequency of use:**	**Remarks**
Exposure duration	8 h		
Application duration	360 min		

Human factors not influenced by risk management	
Covers skin contact area up to:	2 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure				
Area of use	**Room size:**	**Temperature :**	**Ventilation rate**	**Remarks**
Indoor use	30 m3		4.2	

Other relevant operational conditions:	Release area: 0.25 m² Mass transfer rate: 0.0004 m/min Molecular weight of matrix: 3000 g/mol Diffusion coefficient: 0.001 cm2/min. Layer thickness: 7 cm

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel.	
	Dermal	Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear suitable gloves.	80 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Professional and consumer use of sealants:

ERC8b, ERC8c, ERC8f:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none

marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none
soil	0.000143 mg/kg wet weight	0.00623	EUSES v2.1.2	none
Sewage treatment plant	0 mg/l	0	EUSES v2.1.2	none
Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Professional and consumer use of sealants:

PROC19:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.0000020 mg/m³	0.000001	ConsExpo v4.1	> 4 hours
Worker - dermal, long-term - systemic	indoor	0.00488 mg/kg bw/day	0.00113	ConsExpo v4.1	Hand protection 80 % > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario VI.

Exposure scenario consumer

1.Professional and consumer use of sealants:

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU21: Consumer uses: Private households (= general public = consumers)
Product Categories:	PC1: Adhesives, sealants

Name of contributing environmental scenario and corresponding ERC	Professional and consumer use of sealants: ERC8b: Wide dispersive indoor use of reactive substances in open systems 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

List of names of contributing worker scenarios and corresponding PROCs	Professional and consumer use of sealants: :

2.1.Contributing exposure scenario controlling environmental exposure for: Professional and consumer use of sealants

Environmental Release Category (ERC)	ERC8b ERC8c ERC8f: Wide dispersive indoor use of reactive substances in open systems Wide dispersive indoor use resulting in inclusion into or onto a matrix Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Product characteristics

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

Physical state	liquid

Viscosity	
Kinematic viscosity	5.7 mm2/s (20 °C)
Dynamic viscosity	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	0.0027 tonnes/day
Annual amount per site	1 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process	not relevant
Continuous process	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	365	0 %	-	0 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	sewage treatment plant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	Not applicable
Remarks	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste

none

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling consumer exposure for: Professional and consumer use of sealants

Product Categories:	PC1: Adhesives, sealants

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant
Application:	not relevant

Amounts used

Amount per use	1 kg

Frequency and duration of use

	Use duration (h/d):	Frequency of use:	Remarks
Exposure duration	375 min		
Application duration	360 min		

Human factors not influenced by risk management

Covers skin contact area up to:	2 cm^2
bodyweight:	65 kg
Breathing volume:	26 m^3/day

Other given operational conditions affecting consumers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use	10 m3		2	

Other relevant operational conditions	Release area: 0.20 m^2 Mass transfer rate: 0.0004 m/min Molecular weight of matrix: 3000 g/mol Diffusion coefficient: 0.001 cm2/min. Layer thickness: 7 cm

Risk management measures (RMM)

Conditions and measures related to information and behavioural advice to consumers

Consumer uses	Inhalation Open doors and windows.
Consumer uses	Dermal Use personal protective equipment. See Section 8 of the Safety Data Sheet.

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

See chapter 8 of the safety data sheet (Personal protection equipment)

Additional good practice advice beyond the REACH CSA

not relevant

3. Exposure estimation and reference to its source

Environment:

Professional and consumer use of sealants:

ERC8b, ERC8c, ERC8f:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none
marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none
soil	0.000143 mg/kg wet weight	0.00623	EUSES v2.1.2	none
Sewage treatment plant	0 mg/l	0	EUSES v2.1.2	none
Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Professional and consumer use of sealants:

PC1:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Consumer - inhalative, short-term - systemic	indoor	0.0000032 mg/m³	0.000001	ConsExpo v4.1	none
Consumer - dermal, short-term - systemic	indoor	0.0262 mg/kg bw/day	0.0170	ConsExpo v4.1	none

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

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Exposure Scenario VII.

Exposure scenario worker

1.Formulation of coatings

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Product categories [PC]:	PC9a: Coatings and paints, thinners, paint removers

Name of contributing environmental scenario and corresponding ERC	Formulation of coatings: ERC2: Formulation of preparations

List of names of contributing worker scenarios and corresponding PROCs	Formulation of coatings: PROC2: Use in closed, continuous process with occasional controlled exposure Formulation of coatings: PROC3: Use in closed batch process (synthesis or formulation) Formulation of coatings: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Formulation of coatings: PROC5: Mixing or blending in batch processes Formulation of coatings: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-

	dedicated facilities Formulation of coatings: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Formulation of coatings: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2.1.Contributing exposure scenario controlling environmental exposure for: Formulation of coatings

Environmental Release Category (ERC)	ERC2: Formulation of preparations

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	2 tonnes/day
Annual amount per site	400 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	200	0.25 %	-	0.5 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	**Frequency of use:**	**Remarks**
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	**Room size:**	**Temperature :**	**Ventilation rate**	**Remarks**
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	**Route of Exposure**	**Protective Measures**	**Effectiveness**	**Remarks**
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC5: Mixing or blending in batch processes

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Formulation of coatings

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Formulation of coatings:

ERC2:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.151 mg/l	0.753	EUSES v2.1.2	none
freshwater sediment	0.118 mg/kg wet weight	0.755	EUSES v2.1.2	none
marine water	0.0151 mg/l	0.753	EUSES v2.1.2	none
Marine sediments	0.0118 mg/kg wet weight	0.755	EUSES v2.1.2	none

soil	0.00223 mg/kg wet weight	0.0972	EUSES v2.1.2	none
Sewage treatment plant	1.5 mg/l	0.0682	EUSES v2.1.2	none
Air	0.000228 mg/m³	0.1	EUSES v2.1.2	none

Health:

Formulation of coatings:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.285 mg/m³	0.00936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00274 mg/kg bw/day	0.000636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of coatings:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.854 mg/m³	0.0281	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00137 mg/kg bw/day	0.000318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of coatings:

PROC4:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of coatings:

PROC5:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of coatings:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation of coatings:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Formulation of coatings:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario VIII.

Exposure scenario worker

1.Industrial use of coatings (e.g. beverage can)

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18: Manufacture of furniture
Product categories [PC]:	PC9a: Coatings and paints, thinners, paint removers

Name of contributing environmental scenario and corresponding ERC	Industrial use of coatings (e.g. beverage can): ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6c: Industrial use of monomers for manufacture of thermoplastics

List of names of contributing worker scenarios and corresponding PROCs	Industrial use of coatings (e.g. beverage can): PROC7: Industrial spraying Industrial use of coatings (e.g. beverage can): PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Industrial use of coatings (e.g. beverage can): PROC10: Roller application or brushing Industrial use of coatings (e.g. beverage can): : Treatment of articles by dipping and pouring Industrial use of coatings (e.g. beverage can): PROC19: Hand-mixing with intimate contact and only PPE available

2.1.Contributing exposure scenario controlling environmental exposure for: Industrial use of coatings (e.g. beverage can)

Environmental Release Category (ERC)	ERC5 ERC6c: Industrial use resulting in inclusion into or onto a matrix Industrial use of monomers for manufacture of thermoplastics

Product characteristics	
Concentration of the substance in a mixture:	Covers percentage substance in the product up to 5%.
Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	1 tonnes/day
Annual amount per site	100 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	**Emission days**	**Emission factors**			**Remarks**
		Air	**Soil**	**Water**	
Continuous	100	1 %	-	0 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	No release to waste water, Prevent substance from entering water.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m³/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Industrial use of coatings (e.g. beverage can)

Process Categories:	PROC7: Industrial spraying

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1500 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Industrial use of coatings (e.g. beverage can)

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Industrial use of coatings (e.g. beverage can)

Process Categories:	PROC10: Roller application or brushing

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Industrial use of coatings (e.g. beverage can)

Process Categories:	: Treatment of articles by dipping and pouring

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Industrial use of coatings (e.g. beverage can)

Process Categories:	PROC19: Hand-mixing with intimate contact and only PPE available

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1980 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Industrial use of coatings (e.g. beverage can):

ERC5, ERC6c:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none
marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none

soil	0.00116 mg/kg wet weight	0.0506	EUSES v2.1.2	none
Sewage treatment plant	0 mg/l	0	EUSES v2.1.2	none
Air	0.000114 mg/m³	0.1	EUSES v2.1.2	none

Health:

Industrial use of coatings (e.g. beverage can):

PROC7:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0429 mg/kg bw/day	0.00994	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Industrial use of coatings (e.g. beverage can):

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.712 mg/m³	0.0234	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Industrial use of coatings (e.g. beverage can):

PROC10:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.549 mg/kg bw/day	0.127	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of coatings (e.g. beverage can):

:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Industrial use of coatings (e.g. beverage can):

PROC19:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	2.83 mg/kg bw/day	0.657	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario IX.

Exposure scenario worker

1.Professional and consumer use of coatings

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen) SU19: Building and construction work
Product categories [PC]:	PC9a: Coatings and paints, thinners, paint removers

Name of contributing environmental scenario and corresponding ERC	Professional and consumer use of coatings: 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

List of names of contributing worker scenarios and corresponding PROCs	Professional and consumer use of coatings: PROC10: Roller application or brushing PROC19: Hand-mixing with intimate contact and only PPE available Professional and consumer use of coatings: PROC11: Non industrial spraying Professional and consumer use of coatings: : Treatment of articles by dipping and pouring

2.1.Contributing exposure scenario controlling environmental exposure for: Professional and consumer use of coatings

Environmental Release Category (ERC)	ERC8c ERC8f: Wide dispersive indoor use resulting in inclusion into or onto a matrix Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	0.0027 tonnes/day
Annual amount per site	1 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	365	0.15 %	-	0.01 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	not relevant
Soil	The expected exposure level is minimal.
Water	Prevent substance from entering water.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:
none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	Not applicable
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste
This information is not available.

Additional good practice advice beyond the REACH CSA
This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Professional and consumer use of coatings

Process Categories:	PROC10: Roller application or brushing PROC19: Hand-mixing with intimate contact and only PPE available

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use	100 m3			

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

This information is not available.

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel.	
	Dermal	Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear suitable gloves.	80 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Professional and consumer use of coatings

Process Categories:	PROC11: Non industrial spraying

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1500 cm²
bodyweight:	70 kg

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature :	Ventilation rate	Remarks
Indoor use	100 m3			

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

This information is not available.

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel.	
	Dermal	Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear suitable gloves.	80 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Professional and consumer use of coatings

Process Categories:	: Treatment of articles by dipping and pouring

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use	100 m3			

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

This information is not available.

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel.	
	Dermal	Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear suitable gloves.	80 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Professional and consumer use of coatings:

ERC8c, ERC8f:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none
marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none
soil	0.000143 mg/kg wet weight	0.00623	EUSES v2.1.2	none
Sewage treatment plant	0.0000003 mg/l	0.000001	EUSES v2.1.2	none

Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Professional and consumer use of coatings:

PROC10:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.198 mg/m³	0.00651	Stoffenmanager v5.1	> 4 hours Spray application with little or no aerosol formation.
Worker - dermal, long-term - systemic	indoor	0.549 mg/kg bw/day	0.127	ECETOC TRA v3 (2012)	Hand protection 80 % > 4 hours

Professional and consumer use of coatings:

PROC11:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.904 mg/m³	0.0297	Stoffenmanager v5.1	> 4 hours Spray application with distinct aerosol formation.
Worker - dermal, long-term - systemic	indoor	2.14 mg/kg bw/day	0.497	ECETOC TRA v3 (2012)	Hand protection 80 % > 4 hours

Professional and consumer use of coatings:

:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.198 mg/m³	0.00651	Stoffenmanager v5.1	> 4 hours Spray application with little or no aerosol formation.
Worker - dermal, long-term - systemic	indoor	0.274 mg/kg bw/day	0.0636	ECETOC TRA v3 (2012)	Hand protection 80 % > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario X.

Exposure scenario consumer

1.Professional and consumer use of coatings:

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU21: Consumer uses: Private households (= general public = consumers)
Product Categories:	PC9a: Coatings and paints, thinners, paint removers

Name of contributing environmental scenario and corresponding ERC	Professional and consumer use of coatings: 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

List of names of contributing worker scenarios and corresponding PROCs	Professional and consumer use of coatings: :

2.1.Contributing exposure scenario controlling environmental exposure for: Professional and consumer use of coatings

Environmental Release Category (ERC)	ERC8c ERC8f: Wide dispersive indoor use resulting in inclusion into or onto a matrix Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical state	liquid

Viscosity	
Kinematic viscosity	5.7 mm2/s (20 °C)
Dynamic viscosity	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	0.0027 tonnes/day
Annual amount per site	1 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process	not relevant
Continuous process	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	365	0.15 %	-	0.01 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m³/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	sewage treatment plant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	Not applicable
Remarks	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		

Conditions and measures related to external recovery of waste

none

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling consumer exposure for: Professional and consumer use of coatings

Product Categories:	PC9a: Coatings and paints, thinners, paint removers

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 1 %.

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant
Application:	not relevant

Amounts used

Amount per use	1 kg

Frequency and duration of use

	Use duration (h/d):	Frequency of use:	Remarks
Exposure duration	132 min		
Application duration	120 min		

Human factors not influenced by risk management

Covers skin contact area up to:	960 cm²
bodyweight:	65 kg

Other given operational conditions affecting consumers exposure

Area of use	Room size:	Temperature :	Ventilation rate	Remarks
Indoor use	20 m3		0.6	

Other relevant operational conditions	Release area: 1.5 m² Molecular weight of matrix: 300 g/mol Mass transfer rate: 2040 m/min

Risk management measures (RMM)

Conditions and measures related to information and behavioural advice to consumers

Consumer uses	Inhalation Open doors and windows.
Consumer uses	Dermal Use personal protective equipment. See Section 8 of the Safety Data Sheet.

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

See chapter 8 of the safety data sheet (Personal protection equipment)

Additional good practice advice beyond the REACH CSA

not relevant

3. Exposure estimation and reference to its source

Environment:

Professional and consumer use of coatings:

ERC8c, ERC8f:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000552 mg/l	0.00276	EUSES v2.1.2	none
freshwater sediment	0.000433 mg/kg wet weight	0.00277	EUSES v2.1.2	none
marine water	0.0000539 mg/l	0.0027	EUSES v2.1.2	none
Marine sediments	0.0000423 mg/kg wet weight	0.0027	EUSES v2.1.2	none
soil	0.000143 mg/kg wet weight	0.00623	EUSES v2.1.2	none
Sewage treatment plant	0.0000003 mg/l	0.000001	EUSES v2.1.2	none
Air	0.0000001 mg/m³	0.1	EUSES v2.1.2	none

Health:

Professional and consumer use of coatings:

PC9a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Consumer - inhalative, short-term - systemic	indoor	0.000144 mg/m³	0.000027	ConsExpo v4.1	none
Consumer - dermal, short-term - systemic	indoor	0.554 mg/kg bw/day	0.360	ConsExpo v4.1	none

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario XI.

Exposure scenario worker

1.Formulation and use of non-metal surface treatment solutions/dispersions

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU9: Manufacture of fine chemicals SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU11: Manufacture of rubber products SU12: Manufacture of plastics products, including compounding and conversion SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement
Product categories [PC]:	PC15: Non-metal surface treatment products

Name of contributing environmental scenario and corresponding ERC	<u>Formulation and use of non-metal surface treatment solutions/dispersions:</u> ERC2: Formulation of preparations ERC3: Formulation in materials ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6b: Industrial use of reactive processing aids ERC6c: Industrial use of monomers for manufacture of thermoplastics

List of names of contributing worker scenarios and corresponding PROCs	Formulation and use of non-metal surface treatment solutions/dispersions: PROC1: Use in closed process, no likelihood of exposure Formulation and use of non-metal surface treatment solutions/dispersions: PROC2: Use in closed, continuous process with occasional controlled exposure Formulation and use of non-metal surface treatment solutions/dispersions: PROC3: Use in closed batch process (synthesis or formulation) Formulation and use of non-metal surface treatment solutions/dispersions: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Formulation and use of non-metal surface treatment solutions/dispersions: PROC5: Mixing or blending in batch processes Formulation and use of non-metal surface treatment solutions/dispersions: PROC7: Industrial spraying Formulation and use of non-metal surface treatment solutions/dispersions: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Formulation and use of non-metal surface treatment solutions/dispersions: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Formulation and use of non-metal surface treatment solutions/dispersions: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) Formulation and use of non-metal surface treatment solutions/dispersions: : Treatment of articles by dipping and pouring

2.1.Contributing exposure scenario controlling environmental exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Environmental Release Category (ERC)	ERC2 ERC3 ERC5 ERC6b ERC6c: Formulation of preparations Formulation in materials Industrial use resulting in inclusion into or onto a matrix Industrial use of reactive processing aids Industrial use of monomers for manufacture of thermoplastics

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	1 tonnes/day
Annual amount per site	100 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	Emission days	Emission factors			Remarks
		Air	Soil	Water	
Continuous	100	7.5 %	-	4 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC1: Use in closed process, no likelihood of exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	**Frequency of use:**	**Remarks**
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	**Room size:**	**Temperature :**	**Ventilation rate**	**Remarks**
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	**Route of Exposure**	**Protective Measures**	**Effectiveness**	**Remarks**
Industrial uses:	Inhalation	General ventilation		

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC5: Mixing or blending in batch processes

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC7: Industrial spraying

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1500 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.9. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.10. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.11. Contributing exposure scenario controlling worker exposure for: Formulation and use of non-metal surface treatment solutions/dispersions

Process Categories:	: Treatment of articles by dipping and pouring

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Formulation and use of non-metal surface treatment solutions/dispersions:

ERC2, ERC3, ERC5, ERC6b, ERC6c:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.151 mg/l	0.753	EUSES v2.1.2	none
freshwater sediment	0.118 mg/kg wet weight	0.755	EUSES v2.1.2	none
marine water	0.0151 mg/l	0.753	EUSES v2.1.2	none
Marine sediments	0.0118 mg/kg wet weight	0.755	EUSES v2.1.2	none

soil	0.00783 mg/kg wet weight	0.341	EUSES v2.1.2	none
Sewage treatment plant	1.5 mg/l	0.0682	EUSES v2.1.2	none
Air	0.000857 mg/m³	0.1	EUSES v2.1.2	none

Health:

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC1:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.142 mg/m³	0.00468	ECETOC TRA v3 (2012)	> 4 hours
Worker - dermal, long-term - systemic	indoor	0.0343 mg/kg bw/day	0.00795	ECETOC TRA v3 (2012)	> 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.285 mg/m³	0.00936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00274 mg/kg bw/day	0.000636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	0.854 mg/m³	0.0281	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00137 mg/kg bw/day	0.000318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC4:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC5:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC7:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0429 mg/kg bw/day	0.00994	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0467	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use of non-metal surface treatment solutions/dispersions:

:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	2.85 mg/m³	0.0936	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0274 mg/kg bw/day	0.00636	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

XII. Exposure Scenario

Exposure scenario worker

1.Formulation and use in non-aqueous polymer preparation

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU11: Manufacture of rubber products
Product categories [PC]:	PC32: Polymer preparations and compounds

Name of contributing environmental scenario and corresponding ERC	Formulation and use in non-aqueous polymer preparation: ERC3: Formulation in materials ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6c: Industrial use of monomers for manufacture of thermoplastics ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

List of names of contributing worker scenarios and corresponding PROCs	Formulation and use in non-aqueous polymer preparation: PROC2: Use in closed, continuous process with occasional controlled exposure Formulation and use in non-aqueous polymer preparation: PROC3: Use in closed batch process (synthesis or formulation) Formulation and use in non-aqueous polymer preparation: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Formulation and use in non-aqueous polymer preparation: PROC5: Mixing or blending in batch processes Formulation and use in non-aqueous polymer preparation: PROC7: Industrial spraying Formulation and use in non-aqueous polymer preparation: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Formulation and use in non-aqueous polymer preparation: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Formulation and use in non-aqueous polymer preparation: PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) Formulation and use in non-aqueous polymer preparation: PROC14: Production of preparations or articles by tabletting,

	compression, extrusion, pelletisation Formulation and use in non-aqueous polymer preparation: PROC21: Low energy manipulation of substances bound in materials and/or articles

2.1.Contributing exposure scenario controlling environmental exposure for: Formulation and use in non-aqueous polymer preparation

Environmental Release Category (ERC)	ERC3 ERC4 ERC6c ERC6d: Formulation in materials Industrial use of processing aids in processes and products, not becoming part of articles Industrial use of monomers for manufacture of thermoplastics Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Product characteristics

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

Physical state	liquid

Viscosity:	
Kinematic viscosity:	5.7 mm2/s (20 °C)
Dynamic viscosity:	6.5 mPa.s (20 °C, DIN 53015)

Amounts used

Daily amount per site	0.2 tonnes/day
Annual amount per site	40 t(onnes)/year
Fraction tonnage per region	50 %

Frequency and duration of use

Batch process:	not relevant
Continuous process:	not relevant

Environment factors not influenced by risk management

Flow rate of receiving surface water (m^3/d):	not relevant
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

type	**Emission days**	**Emission factors**			**Remarks**
		Air	**Soil**	**Water**	

Continuous	200	7.5 %	-	0.005 %	

Other relevant operational conditions	not relevant

Risk management measures (RMM)

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

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Exhaust gas disposal: combustion or other adequate exhaust gas treatment
Soil	The expected exposure level is minimal.
Water	Prevent substance from entering water., Dispose of only in treatment plants with adapted bacteria., Ensure all waste water is collected and treated via a WWTP.
Sediment:	The expected sediment exposure level is minimal.
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

Size of municipal sewage system/treatment plant (m^3/d):	
type:	sewage treatment plant
Discharge rate:	2,000 m3/d
Treatment effectiveness:	not relevant
Sludge treatment technique:	Controlled application to agricultural soil.
Measures to limit air emissions:	not relevant
Remarks:	Stream water

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
With respect to local regulations, e.g. dispose of to suitable waste incineration plant.		
Recycle by a suitable method.		

Conditions and measures related to external recovery of waste

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

2.2. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.3. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.4. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.5. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC5: Mixing or blending in batch processes

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.6. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC7: Industrial spraying

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Hands and forearms	1500 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	
		[In case of inadequate ventilation] wear respiratory protection.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.7. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.8. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Both hands	960 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	95 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.9. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

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

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.10. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of both hands	480 cm²
bodyweight:	70 kg
Breathing volume:	10 m3/8 hours

Other given operational conditions affecting workers exposure

Area of use	Room size:	Temperature:	Ventilation rate	Remarks
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel., Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

2.11. Contributing exposure scenario controlling worker exposure for: Formulation and use in non-aqueous polymer preparation

Process Categories:	PROC21: Low energy manipulation of substances bound in materials and/or articles

Product characteristics

Concentration of the substance in a mixture:	

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

This information is not available.

Human factors not influenced by risk management

This information is not available.

Other given operational conditions affecting workers exposure

Other relevant operational conditions:	PROC21: . On account of the low vapor pressure it is unlikely that the exposure will exceed the already quantified PROCs.

Risk management measures (RMM)

This information is not available.

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Formulation and use in non-aqueous polymer preparation:

ERC3, ERC4, ERC6c, ERC6d:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Fresh water	0.000927 mg/l	0.00463	EUSES v2.1.2	none
freshwater sediment	0.000727 mg/kg wet weight	0.00464	EUSES v2.1.2	none
marine water	0.0000914 mg/l	0.00457	EUSES v2.1.2	none
Marine sediments	0.0000717 mg/kg wet weight	0.00458	EUSES v2.1.2	none
soil	0.0154 mg/kg wet weight	0.672	EUSES v2.1.2	none
Sewage treatment plant	0.00375 mg/l	0.00017	EUSES v2.1.2	none
Air	0.00171 mg/m³	0.1	EUSES v2.1.2	none

Health:

Formulation and use in non-aqueous polymer preparation:

PROC2:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	1.42 mg/m³	0.0468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0137 mg/kg bw/day	0.00318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC3:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	4.27 mg/m³	0.140	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00686 mg/kg bw/day	0.00159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC4:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC5:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC7:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) Respiratory equipment 90% (PRE 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.214 mg/kg bw/day	0.0497	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC8a:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	14.2 mg/m³	0.468	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.137 mg/kg bw/day	0.0318	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC8b:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	3.56 mg/m³	0.117	ECETOC TRA v3 (2012)	Local exhaust ventilation 95% (LEV 95%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 95% (LEV 95%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC9:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0686 mg/kg bw/day	0.0159	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC14:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.12 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.0343 mg/kg bw/day	0.00795	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

Formulation and use in non-aqueous polymer preparation:

PROC21:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic			0		not to be determined
Worker - dermal, long-term - systemic			0		not to be determined

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool ("scaling tool"), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.

Exposure Scenario XIII.

Exposure scenario worker

1.Use as laboratory reagent (industrial)

List of use descriptors	
Life Cycle Stage	
Sector(s) of use	SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU24: Scientific research and development
Product categories [PC]:	PC21: Laboratory chemicals

Name of contributing environmental scenario and corresponding ERC	

List of names of contributing worker scenarios and corresponding PROCs	Use as laboratory reagent (industrial): : Use as laboratory reagent

2.2. Contributing exposure scenario controlling worker exposure for: Use as laboratory reagent (industrial)

Process Categories:	: Use as laboratory reagent

Product characteristics

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

Physical form of the product:	liquid
Vapour pressure:	0.1 hPa
Process temperature:	20 °C
Remarks	not relevant

Amounts used

Frequency and duration of use

	Use duration:	**Frequency of use:**	**Remarks**
duration of activity	240 min		

Human factors not influenced by risk management

Exposed skin areas:

Palm of one hand	240 cm²

Other given operational conditions affecting workers exposure

Area of use	**Room size:**	**Temperature :**	**Ventilation rate**	**Remarks**
Indoor use				

Other relevant operational conditions:	not relevant

Risk management measures (RMM)

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

See chapter 7 of the safety data sheet

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

Application	**Route of Exposure**	**Protective Measures**	**Effectiveness**	**Remarks**
Industrial uses:	Inhalation	General ventilation, Local exhaust ventilation (LEV)	90 %	

Organisational measures to prevent/limit releases, dispersion and exposure

Application	Route of Exposure	Protective Measures	Remarks
Industrial uses:	Inhalation	The product should only be handled by trained personnel.	
	Dermal	Assumes a good basic standard of occupational hygiene is implemented.	

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

Application	Route of Exposure	Protective Measures	Effectiveness	Remarks
Industrial uses:	Inhalation	For personal protection see section 8.		
	Dermal	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	90 %	

Additional good practice advice beyond the REACH CSA

This information is not available.

3. Exposure estimation

Environment:

Health:

Use as laboratory reagent (industrial):

:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
Worker - inhalative, long-term - systemic	indoor	7.11 mg/m³	0.234	ECETOC TRA v3 (2012)	Local exhaust ventilation 90% (LEV 90%) > 4 hours
Worker - dermal, long-term - systemic	indoor	0.00343 mg/kg bw/day	0.000795	ECETOC TRA v3 (2012)	Hand protection 90 % Local exhaust ventilation 90% (LEV 90%) > 4 hours

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

Information on Scaling: http://www.umweltbundesamt.de/publikationen/scaling-unter-reach Generic exposure tools such as ECETOC Targeted Risk Assessment Tool (TRA), are currently widely used for chemical safety assessments under REACH: http://www.ecetoc.org/tra This document aims to explain in simple terms the obligations which downsteam users have to fulfil to comply with the REACH Regulation: http://www.echa.europa.eu/documents/10162/13634/du_nutshell_guidance_en.pdf If downstream user conditions deviate from the scenario, the downstream use is assumed to be within the boundaries when the following criteria are met: Exposure estimation for the modified conditions, using the method described in the scenario or a compatible tool (“scaling tool”), is equal to or lower than the values given in the scenario. Scalable parameters are restricted to those that a downstream user can actively change by adapting his conditions. Scalable parameters, which correspond to quantitative values given in the exposure scenario, may depend on the method used for assessment. It has to be noted that basic assumptions of the methods, e.g. the exposed skin area for a specific task, may not be modified. The same applies for intrinsic substance properties like vapour pressure or diffusion rates.