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

1.1 Product identifier

Denspartic Hardener

Chemical Name: Hexamethylene-1,6-diisocyanate Homopolymer

EC-No.: 500-060-2

REACH Registration Number: 01-2119488934-20-0000

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

Use:
Hardener for coating materials or adhesives for industrial and trade applications
For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

Uses advised against:
Not suitable for use in homeworker (DIY) applications.

1.3 Details of the supplier of the safety data sheet

Dencoat
E-mail: info@dencoat.com
Website: www.dencoat.com

1.4 Emergency telephone number

In case of emergency: +45 88442227

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Acute toxicity, Inhalative, Category 4 (H332)
Sensitization of the skin, Category 1 (H317)
Specific target organ toxicity (single exposure), Category 3 (H335)

2.2 Label elements

Warning

Hazardous components which must be listed on the label
hexamethylene-1,6-diisocyanate homopolymer
EC-No.: 500-060-2

Hazard statements:
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.

Precautionary statements:
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

2.3 Other hazards
No information available.

SECTION 3: Composition/information on ingredients

Type of product: Substance

3.1 Substances

hexamethylene-1,6-diisocyanate Homopolymer

Hazardous components

hexamethylene-1,6-diisocyanate homopolymer
Concentration [wt.-%]: ca. 100
EC-No.: 500-060-2
REACH Registration Number: 01-2119488934-20-0000
CAS-No.: 28182-81-2
Classification (1272/2008/CE): Acute Tox. 4 Inhalative H332 Skin Sens. 1 H317 STOT SE 3 H335

This contains:

Hexamethylene-1,6-diisocyanate
Concentration [wt.-%]: < 0.25
Index-No.: 615-011-00-1
REACH Registration Number: 01-2119457571-37-0000, 01-2119457571-37-0005, 01-2119457571-37-0006
CAS-No.: 822-06-0
Classification (1272/2008/CE): Acute Tox. 4 Oral H302 Acute Tox. 1 Inhalative H330 Skin Irrit. 2 H315 Eye Irrit. 2 H319 Resp. Sens. 1 H334 Skin Sens. 1 H317 STOT SE 3 H335
Specific threshold concentration (GHS):

Resp. Sens. 1	H334	>= 0.5 %
Skin Sens. 1	H317	>= 0.5 %

Exposure scenarios are not required for the impurities of the substance according to article 3(1) of Regulation (EC) No 1907/2006 mentioned above.

Candidate List of Substances of Very High Concern for Authorisation
This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice: Take off all contaminated clothing immediately.

If inhaled: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

In case of skin contact: In case of skin contact wash affected areas thoroughly with soap and plenty of water. Consult a doctor in the event of a skin reaction.

In case of eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.

If swallowed: DO NOT induce the patient to vomit, medical advice is required.

4.2 Most important symptoms and effects, both acute and delayed Notes

to physician: Basic first aid, decontamination, symptomatic treatment.

4.3 Indication of any immediate medical attention and special treatment needed

Therapeutic measures: No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2), Foam, extinguishing powder, in cases of larger fires, water spray should be used.
Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen, isocyanate vapors and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.

5.3 Advice for fire-fighters

During fire-fighting respirator with independent air-supply and airtight garment is required.
Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Put on protective equipment (see section 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

6.2 Environment related measures

Do not allow to escape into waterways, wastewater or soil.

6.3 Methods and material for containment and cleaning up

Remove mechanically; cover the remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO2!). Keep damp in a safe ventilated area for several days.

6.4 Reference to other sections

For further disposal measures see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

If an annex according to REACH-Regulation (EU) No. 1907/2006 is attached to this MSDS, the general conditions of use are further specified in the corresponding exposure scenarios.

Provide sufficient air exchange and/or exhaust in work rooms. Exhaust ventilation necessary if product is sprayed.

The threshold limit values noted in section 8 must be monitored. In all areas where isocyanate aerosols and/or vapor concentrations are produced in elevated concentrations, exhaust ventilation must be provided in such a way that the workplace exposure limits (WEL) is not exceeded. The air should be drawn away from the personnel handling the product

The personal protective measures described in section 8 must be observed. The precautions required in the handling of isocyanates must be taken. Avoid contact with skin and eyes and the inhalation of vapor.
Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities

Keep container dry and tightly closed in a cool and well ventilated place. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet.

Storage class (TRGS 510) : 10: Combustible liquids

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

If an annex according to Regulation (EU) No. 1907/2006 is attached to this MSDS, the general RMMs are further specified in the corresponding exposure scenarios.

UK Workplace Exposure Limits (WEL), per EH40 document (Health & Safety Executive). If no UK value exists, EU exposure limits given where available.

8.1 Control parameters

Components with workplace control parameters

Substance	CAS-No.	Basis	Type	Value	Ceiling Limit Value	Remarks
Hexamethylene-1,6-diisocyanate	822-06-0	EH40 WEL	STEL	0.07 mg/m3		, measured as NCO
Hexamethylene-1,6-diisocyanate	822-06-0	EH40 WEL	TWA	0.02 mg/m3		, measured as NCO

Exposition assessment value (EBW) per TGRS 430:Polyisocyanate content (HDI oligomers and/or prepolymers) 100 %. Use an exposition assessment value of 0,35 mg/m³.

Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL)

hexamethylene-1,6-diisocyanate homopolymer

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term local effects	0.5 mg/m3	Most sensitive endpoint: Irritation (respiratory tract)
Workers	Inhalation	Acute local effects	1 mg/m3	Most sensitive endpoint: Irritation (respiratory tract)
Workers	Dermal	Long-term local effects		No quantitative risk assessment possible. Most sensitive endpoint: Sensitisation (skin)
Workers	Dermal	Acute local effects		No quantitative risk assessment possible. Most sensitive endpoint: Sensitisation (skin)

Predicted No Effect Concentration (PNEC)

hexamethylene-1,6-diisocyanate homopolymer

Compartment	Value	Remarks
Fresh water	0.199 mg/l	
Fresh water sediment	44551 mg/kg dry weight	
Marine water	0.0199 mg/l	
Marine sediment	4455 mg/kg dry weight	
Sewage treatment plant	100 mg/l	
Soil	8884 mg/kg dry weight	
Oral		Not relevant

8.2 Exposure controls

Respiratory protection
Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.

Further recommendations regarding respiratory protection can be found in the individual exposure scenarios in the appendix.

In case of hypersensitivity of the respiratory tract and skin (e.g. asthmatics and those who suffer from chronic bronchitis and chronic skin complaint) it is inadvisable to work with the product.

Hand protection
Suitable materials for safety gloves; EN 374:
Butyl rubber - IIR: thickness >=0,5mm; breakthrough time >=480min.
Fluorinated rubber - FKM: thickness >=0,4mm; breakthrough time >=480min.
Laminate glove - PE/EVAL/PE; breakthrough time >=480 min.
Recommendation: contaminated gloves should be disposed of.

Eye protection
Wear eye/face protection.

Skin and body protection
Wear suitable protective clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	liquid	
Colour:	colourless	
Odour:	slight inherent odour	
Odour Threshold:	not established	
pH:	not applicable	
Flash point:	ca. 203 °C at 1,013 hPa	DIN EN 22719
Evaporation rate:	not established	
Flammability (solid, gas):	not applicable	
Burning number:	not applicable	
Vapour pressure:	< 0.00001 hPa at 20 °C	EG A4
Vapour pressure of ingredients:		
Hexamethylene-1,6-diisocyanate	ca. 0.007 hPa at 20 °C	
Vapour density:	not established	
Density:	ca. 1.15 g/cm³ at 20 °C	DIN 51757
Miscibility with water:	immiscible at 15 °C	
Surface tension:	ca. 46.5 mN/m at 20 °C	
Partition coefficient (n−octanol/water):	log Pow: ca. 8.38 (value calculated)	
Auto-ignition temperature:	not applicable	
Ignition temperature:	ca. 440 °C	DIN 51794
Decomposition temperature:	ca. 150 °C	
Viscosity, dynamic:	ca. 958 mPa.s at 20 °C	DIN 53019
Explosive properties:	Not explosive	
Dust explosion class:	not applicable	
Oxidising properties:	not established	

9.2 Other information

The indicated values do not necessarily correspond to the product specification. Please refer to the technical information sheet for specification data.

SECTION 10: Stability and reactivity

10.1 Reactivity

This information is not available.

10.2 Chemical stability

This information is not available.

10.3 Possibility of hazardous reactions

Exothermic reaction with amines and alcohols; reacts slowly with water forming CO2, in closed containers risk of bursting owing to increase of pressure.

10.4 Conditions to avoid

This information is not available.

10.5 Incompatible materials

This information is not available.

10.6 Hazardous decomposition products

No hazardous decomposition products when stored and handled correctly.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity, oral
hexamethylene-1,6-diisocyanate homopolymer
LD50 rat, female: >= 5,000 mg/kg
Method: OECD Test Guideline 423

Acute toxicity, dermal
hexamethylene-1,6-diisocyanate homopolymer
LD50 rat, male/female: > 2,000 mg/kg
Method: OECD Test Guideline 402
Studies of a comparable product.

LD50 rabbit, male/female: > 2,000 mg/kg
Studies of a comparable product.

Acute toxicity, inhalation
hexamethylene-1,6-diisocyanate homopolymer
LC50 rat, female: 0.390 mg/l, 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Toxicological studies of a comparable product.

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Converted acute toxicity point estimate 1.5 mg/l
Test atmosphere: dust/mist
Method: Expert judgement

Assessment: Harmful if inhaled.

Primary skin irritation
hexamethylene-1,6-diisocyanate homopolymer
Species: rabbit
Result: slight irritant
Classification: No skin irritation
Method: OECD Test Guideline 404

Primary mucosae irritation
hexamethylene-1,6-diisocyanate homopolymer
Species: rabbit
Result: slight irritant
Classification: No eye irritation
Method: OECD Test Guideline 405

Sensitisation
hexamethylene-1,6-diisocyanate homopolymer
Skin sensitization (local lymph node assay (LLNA)):
Species: Mouse
Result: positive
Classification: May cause sensitization by skin contact.
Method: OECD Test Guideline 429

Respiratory sensitization

Classification: No classification according to EC Directives 2006/121/EC or 1999/45/EC as respiratory sensitizer.
No pulmonary sensitisation observed in animal tests.
No pulmonary sensitisation potential was observed in guinea pigs after either intradermal or inhalative induction with polyisocyanate based on hexamethylene diisocyanate.

Subacute, subchronic and prolonged toxicity
hexamethylene-1,6-diisocyanate homopolymer
NOAEL: 3,3 mg/m³ air
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 0,5 - 3,3 - 26,4 mg/m³
Exposure duration: 90 d
Frequency of treatment: 6 hours a day, 5 days a week
Test substance: as aerosol

Method: OECD Test Guideline 413 Toxicological
studies of a comparable product.
Evidence of damage to organs other than the organs of respiration was not found.

Carcinogenicity
hexamethylene-1,6-diisocyanate homopolymer
No data available.

Reproductive toxicity/Fertility
hexamethylene-1,6-diisocyanate homopolymer
Available data show no indications for reproductive toxicity.

Reproductive toxicity/Teratogenicity
hexamethylene-1,6-diisocyanate homopolymer
Animal experiments on structurally similar compounds showed no indication of specific reproductive toxicity.

Genotoxicity in vitro
hexamethylene-1,6-diisocyanate homopolymer
Test type: Salmonella/microsome test (Ames test)
Metabolic activation: with/without
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471

Test type: Point mutation in mammalian cells (HPRT test)
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 476
Toxicological studies of a comparable product.

Test type: Chromosome aberration test in vitro
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 473
Toxicological studies of a comparable product.

Genotoxicity in vivo
No data available.

STOT evaluation – one-time exposure
hexamethylene-1,6-diisocyanate homopolymer
Route of exposure: Inhalative
May cause respiratory irritation.

STOT evaluation – repeated exposure
hexamethylene-1,6-diisocyanate homopolymer
Based on available data, the classification criteria are not met.

Aspiration toxicity

hexamethylene-1,6-diisocyanate homopolymer
Based on available data, the classification criteria are not met.

CMR Assessment
hexamethylene-1,6-diisocyanate homopolymer
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro tests did not show mutagenic effects Based on available data, the classification criteria are not met.
Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Toxicology Assessment
hexamethylene-1,6-diisocyanate homopolymer
Acute effects: Harmful if inhaled.
Sensitization: May cause sensitization by skin contact.

Additional information
Special properties/effects: Over-exposure, especially when spraying coatings containing isocyanate without the necessary precautions, entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract. Delayed appearance of the complaints and development of hypersensitivity (difficult breathing, coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations, including concentrations below the occupational exposure limit. Prolonged contact with the skin may cause tanning and irritant effects.

Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing isocyanate sensitization and respiratory reaction.

SECTION 12: Ecological information

Do not allow to escape into waterways, wastewater or soil.

12.1 Toxicity Acute

Fish toxicity
hexamethylene-1,6-diisocyanate homopolymer
LC50 > 100 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: Directive 67/548/EEC, Annex V, C.1.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Acute toxicity for daphnia
hexamethylene-1,6-diisocyanate homopolymer
EC50 > 100 mg/l
Species: Daphnia magna (Water flea)

Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Acute toxicity for algae
hexamethylene-1,6-diisocyanate homopolymer
ErC50 199 mg/l
Test type: Growth inhibition Species:
scenedesmus subspicatus Exposure
duration: 72 h
Method: Directive 67/548/EEC, Annex V, C.3.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Acute bacterial toxicity
hexamethylene-1,6-diisocyanate homopolymer
EC50 > 10,000 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h Method:
EG-RL 88/302/EEC

Ecotoxicology Assessment
hexamethylene-1,6-diisocyanate homopolymer
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: There is no evidence of a chronic aquatic toxicity.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

12.2 Persistence and degradability

Biodegradability
hexamethylene-1,6-diisocyanate homopolymer
Test type: aerobic
Biodegradation: 2 %, 28 d, i.e. not readily degradable
Method: Directive 67/548/EEC Annex V, C.4.E.
Ecotoxicological studies of the product

Test type: aerobic
Biodegradation: 0 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 C
Ecotoxicological studies of the product

Stability in water
hexamethylene-1,6-diisocyanate homopolymer
Test type: Hydrolysis
Half life: 7.7 h at 23 °C
Method: OECD Test Guideline 111
The substance hydrolyzes rapidly in water.
Studies of a comparable product.

Photodegradation
hexamethylene-1,6-diisocyanate homopolymer
Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 11.7 h
Method: SRC - AOP (calculation)
After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

Test type: Phototransformation in air
Temperature: 25 °C

sensitizer: OH-radicals
Half-life indirect photolysis: 3.1 h
Method: SRC - AOP (calculation)
After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.
Studies of hydrolysis products.

Volatility (Henry's Law constant)
hexamethylene-1,6-diisocyanate homopolymer
Calculated value = < 0.000001 Pa*m3/mol at 25 °C
Method: Bond-method
The substance has to be scored as non-volatile from water.

Calculated value = < 0.000001 Pa*m3/mol at 25 °C
Method: Bond-method
The substance has to be scored as non-volatile from water.
Studies of hydrolysis products.

12.3 Bioaccumulative potential

Bioaccumulation
hexamethylene-1,6-diisocyanate homopolymer
Bioconcentration factor (BCF): 706.2
Method: (calculated)
The substance hydrolyzes rapidly in water.
An accumulation in aquatic organisms is not to be expected.

Bioconcentration factor (BCF): 10.11
Method: (calculated)
An accumulation in aquatic organisms is not to be expected.
Studies of hydrolysis products.

Partition coefficient (n−octanol/water)

log Pow: ca. 8.38(value calculated)

12.4 Mobility in soil

Distribution among environmental compartments
hexamethylene-1,6-diisocyanate homopolymer
Adsorption/Soil
not applicable

Surface tension
ca. 46.5 mN/m at 20 °C

Environmental distribution
hexamethylene-1,6-diisocyanate homopolymer
not applicable

12.5 Results of PBT and vPvB assessment

hexamethylene-1,6-diisocyanate homopolymer
This substance does not meet the criteria for classification as PBT or vPvB.

12.6 Other adverse effects

Isocyanate reacts with water at the interface forming CO2 and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents. Previous experience shows that polyurea is inert and non-degradable.

SECTION 13: Disposal considerations

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

13.1 Waste treatment methods

After final product withdrawal, all residues must be removed from containers (drip-free, powder-free or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated. These containers can be returned for recycling to the appropriate centres set up within the framework of the existing take-back scheme of the chemical industry.

Containers must be recycled in compliance with national legislation and environmental regulations.

None disposal into waste water.

SECTION 14: Transport information

ADR/RID

14.1 UN number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

ADN

14.1 UN number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

IATA

14.1 UN number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

IMDG

14.1 UN number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

14.6 Special precautions for user

See section 6 - 8.

Additional information	:	Not dangerous cargo. Keep dry. Avoid heat above +50 °C. Keep away from foodstuffs, acids and alkalis.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
not applicable

Water contaminating class (Germany)
1 slightly water endangering
(in accordance with Annex 4 to the Directive on Water-Hazardous Substances) Any

existing national regulations on the handling of isocyanates must be observed.

Other regulations
The European Committee of Paint, Printing Ink and Artists' Colours Manufacturers' Associations (CEPE) provides the following information on coatings containing isocyanates: Ready-to-use paints containing isocyanates may have an irritant effect on mucous membranes - especially on breathing organs - and cause hypersensitivity reactions. Inhalation of vapor or spray mist may cause sensitisation. When handling paints

containing isocyanates all precautions required for solvent-containing paints must be followed. Vapor and spray mist in particular should not be inhaled. Allergics and asthmatics as well as people prone to respiratory ailments should not work with isocyanate containing paints.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for:
hexamethylene-1,6-diisocyanate homopolymer

SECTION 16: Other information

Full text of the hazard statements of the CLP classification (1272/2008/CE) referred to under sections 2, 3 and 10.

H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.

The product is used mainly as a hardener in coating materials or adhesives. The handling of coating materials or adhesives containing reactive polyisocyanates and residual monomeric HDI requires appropriate protective measures referred to in this safety data sheet. These products may therefore be used only in industrial or trade applications. They are not suitable for use in homeworker (DIY) applications.

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

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

Annex - Exposure Scenario

Summary of Exposure Scenarios

- Manufacture of substance (ES1)	:	**SU 3; SU8; PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15; ERC1**
- Formulation (ES2)	:	**SU 3; SU 10; PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15; ERC2**
- Industrial end use (ES3)	:	**SU 3; SU12, SU13, SU19; PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15; ERC5, ERC6a, ERC6c, ERC6d**
- Professional end use (ES4)	:	**SU 22; SU 10, SU12, SU13, SU19; PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15; ERC2, ERC8c, ERC8f**

1. Short title of Exposure Scenario: - Manufacture of substance (ES1)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU8:** Manufacture of bulk, large scale chemicals (including petroleum products)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC1:** Manufacture of substances

2.1 Contributing scenario controlling environmental exposure for: ERC1

Product characteristics

Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C

Amount used

Annual amount used per site:	:	> 1000

Environment factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	< 300

Emission or Release Factor: Air	:	0
Emission or Release Factor: Water	:	0
Emission or Release Factor: Soil	:	0

Technical conditions and measures / Organizational measures

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

Air	:	All waste gases from processes are transferred to a combustion unit or to an activated carbon filter.
Water	:	No waste water occurs.
Soil	:	Sealing of all relevant soil surfaces in the facility is required.

Organizational measures to prevent/limit release from the site

Remarks	:	Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit. The waste from processes is disposed by incineration in a waste combustor. During waste treatment, exposure of the environment is not expected.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Not applicable.
Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Exposure duration	:	8 hours/day
Frequency of use	:	<= 220 days/year

Human factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor use

Technical conditions and measures

Use with local exhaust ventilation. Minimal efficiency extract ventilation: 90% In long-term processes where contact to substance cannot be excluded (e.g. filling and mixing operations), containment (e.g. housing) is recommended.

Organisational measures to prevent /limit releases, dispersion and exposure

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning

and maintenance procedures. Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product. Control staff entry to work area. Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing.

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

For processes where the opportunity for exposure arises, the use of gloves and protective clothing is stipulated. Protective gloves complying with EN 374. Wear eye protection/ face protection. In short-term processes where contact to substance cannot be excluded (e.g. sampling operations), an air-fed mask or a combination of activated carbon filter and particular filter is required. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterisation ratio (PEC/PNEC)
			Air	PEC	0	0
			Freshwater	PEC	0 mg/l	0
			Marine water	PEC	0 mg/l	0
			Sediment	PEC	0 mg/kg dry weight	0
			Soil	PEC	0 mg/kg dry weight	0
			STP (sewage-treatme nt plant)	PEC	0 mg/l	0
			Secondary poisoning	PEC	0 mg/kg wet weight	0
			Humans via the environment	PEC	0 mg/kg body weight/day	0

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
All PROCs			short term, inhalation	Not relevant	
All PROCs			short term, dermal	Not relevant	
PROC 1	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 15	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
All PROCs	Qualitative assessment		long term, dermal	*	

*Due to the applied RMMs it is considered that the risks of dermal exposure are sufficiently controlled.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

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

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

1. Short title of Exposure Scenario: - Formulation (ES2)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC2:** Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2

Product characteristics

Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C

Amount used

Annual amount used per site:	:	> 1000

Environment factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	< 300
Emission or Release Factor: Air	:	0
Emission or Release Factor: Water	:	0
Emission or Release Factor: Soil	:	0

Technical conditions and measures / Organizational measures

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

Air	:	All waste gases from processes are transferred to a combustion unit or to an activated carbon filter.
Water	:	No waste water occurs.
Soil	:	Sealing of all relevant soil surfaces in the facility is required.

Organizational measures to prevent/limit release from the site

Remarks	:	Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit. The waste from processes is disposed by incineration in a waste combustor. During waste treatment, exposure of the environment is not expected.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Exposure duration	:	8 hours/day
Frequency of use	:	<= 220 days/year

Human factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor use

Technical conditions and measures

Use with local exhaust ventilation. Minimal efficiency extract ventilation: 90% In long-term processes where contact to substance cannot be excluded (e.g. filling and mixing operations), containment (e.g. housing) is recommended.

Organisational measures to prevent /limit releases, dispersion and exposure

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product. Control staff entry to work area. Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing.

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

For processes where the opportunity for exposure arises, the use of gloves and protective clothing is stipulated. Protective gloves complying with EN 374. Wear eye protection/ face protection. In short-term processes where contact to substance cannot be excluded (e.g. sampling operations), an air-fed mask or a combination of activated carbon filter and particular filter is required. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterisation ratio (PEC/PNEC)
			Air	PEC	0 mg/m³	0
			Freshwater	PEC	0 mg/l	0
			Marine water	PEC	0 mg/l	0
			Sediment	PEC	0 mg/kg dry weight	0
			Soil	PEC	0 mg/kg dry weight	0
			STP (sewage-treatme nt plant)	PEC	0 mg/l	0
			Secondary poisoning	PEC	0 mg/kg wet weight	0
			Humans via the environment	PEC	0 mg/kg body weight/day	0

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
All PROCs			short term, inhalation	Not relevant	
All PROCs			short term, dermal	Not relevant	
PROC 1	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 5	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42

PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 15	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
All PROCs	Qualitative assessment		long term, dermal	*	

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

*Due to the applied RMMs it is considered that the risks of dermal exposure are sufficiently controlled.

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

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

1. Short title of Exposure Scenario: - Industrial end use (ES3)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU12:** Manufacture of plastics products, including compounding and conversion **SU13:** Manufacture of other non-metallic mineral products, e.g. plasters, cement **SU19:** Building and construction work
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC14:** Production of preparations or articles by tabletting, compression, extrusion, pelletisation **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC5:** Industrial use resulting in inclusion into or onto a matrix **ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates) **ERC6c:** Industrial use of monomers for manufacture of thermoplastics **ERC6d:** Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

2.1 Contributing scenario controlling environmental exposure for: ERC5, ERC6a, ERC6c, ERC6d

Product characteristics

Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C

Amount used

Annual amount used per site:	:	> 1000

Environment factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	< 300
Emission or Release Factor: Air	:	0
Emission or Release Factor: Water	:	0
Emission or Release Factor: Soil	:	0

Technical conditions and measures / Organizational measures

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

Air	:	All waste gases from processes are transferred to a combustion unit or to an activated carbon filter.
Water	:	No waste water occurs.
Soil	:	Sealing of all relevant soil surfaces in the facility is required.

Organizational measures to prevent/limit release from the site

Remarks	:	Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit. The waste from processes is disposed by incineration in a waste combustor. During waste treatment, exposure of the environment is not expected.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	In the range of 50%.
Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	<= 220 days/year
General exposures	:	8 hours/day
PROC 5	:	1 - 4 hours/day
PROC 7	:	1 - 4 hours/day
PROC 8a	:	1 - 4 hours/day

Human factors not influenced by risk management

Remarks : None identified for this scenario.

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use

Technical conditions and measures

Use with local exhaust ventilation. Minimal efficiency extract ventilation: 90% In long-term processes where contact to substance cannot be excluded (e.g. filling and mixing operations), containment (e.g. housing) is recommended.

PROC7: Industrial spraying

Local exhaust ventilation (about 0.3 m/sec) has to be used from top to down and overspray has to be collected in a filter.

Organisational measures to prevent /limit releases, dispersion and exposure

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product. Control staff entry to work area. Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing.

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

PROC10: Roller application or brushing

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

PROC13: Treatment of articles by dipping and pouring

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

For processes where the opportunity for exposure arises, the use of gloves and protective clothing is stipulated. Protective gloves complying with EN 374. Wear eye protection/ face protection. In short-term processes where contact to substance cannot be excluded (e.g. sampling operations), an air-fed mask or a combination of activated carbon filter and particular filter is required. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

PROC7: Industrial spraying

Wear a one-way overall, gloves and a full-face respirator mask with external air supply.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterisation
	Method					ratio (PEC/PNEC)
			Air	PEC	0 mg/m³	0
			Freshwater	PEC	0 mg/l	0
			Marine water	PEC	0 mg/l	0
			Sediment	PEC	0 mg/kg dry weight	0
			Soil	PEC	0 mg/kg dry weight	0
			STP (sewage-treatme nt plant)	PEC	0 mg/l	0
			Secondary poisoning	PEC	0 mg/kg wet weight	0
			Humans via the environment	PEC	0 mg/kg body weight/day	0

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
All PROCs			short term, inhalation	Not relevant	
All PROCs			short term, dermal	Not relevant	
PROC 1	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 5	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 7	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 10	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 13	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 14	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 15	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
All PROCs	Qualitative assessment		Workers (dermal)	*	

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

*Due to the applied RMMs it is considered that the risks of dermal exposure are sufficiently controlled.

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

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

1. Short title of Exposure Scenario: - Professional end use (ES4)

Main User Groups	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	:	**SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) **SU12:** Manufacture of plastics products, including compounding and conversion **SU13:** Manufacture of other non-metallic mineral products, e.g. plasters, cement **SU19:** Building and construction work
Process category	:	**PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring **PROC14:** Production of preparations or articles by tabletting, compression, extrusion, pelletisation **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC2:** Formulation of preparations **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

2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC8c, ERC8f

Product characteristics

Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C

Amount used

Annual amount used per site:	:	> 1000

Environment factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	< 300
Emission or Release Factor: Air	:	0
Emission or Release Factor: Water	:	0
Emission or Release Factor: Soil	:	0

Technical conditions and measures / Organizational measures

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

Air	:	All waste gases from processes are transferred to a combustion unit or to an activated carbon filter.
Water	:	No waste water occurs.
Soil	:	Sealing of all relevant soil surfaces in the facility is required.

Organizational measures to prevent/limit release from the site

Remarks	:	Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit. The waste from processes is disposed by incineration in a waste combustor. During waste treatment, exposure of the environment is not expected.

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	In the range of 50%.
Molar Mass	:	545 g/mol
Vapour pressure	:	< 0.00000319 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	<= 220 days/year
General exposures	:	8 hours/day
PROC 5	:	1 - 4 hours/day
PROC 8a	:	1 - 4 hours/day

Human factors not influenced by risk management

Remarks	:	None identified for this scenario.

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor use

Technical conditions and measures

Use with local exhaust ventilation. Minimal efficiency extract ventilation: 90% In long-term processes where contact to substance cannot be excluded (e.g. filling and mixing operations), containment (e.g. housing) is recommended.

PROC11: Non industrial spraying

Local exhaust ventilation (about 0.3 m/sec) has to be used from top to down and overspray has to be collected in a filter.

Organisational measures to prevent /limit releases, dispersion and exposure

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product. Control staff entry to work area. Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing.

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

PROC10: Roller application or brushing

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

PROC13: Treatment of articles by dipping and pouring

Elevated exposure is estimated. Regarding the sensitising effects of the substance, exposure time should be reduced or other effective RMMs should be considered.

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

For processes where the opportunity for exposure arises, the use of gloves and protective clothing is stipulated. Protective gloves complying with EN 374. Wear eye protection/ face protection. In short-term processes where contact to substance cannot be excluded (e.g. sampling operations), an air-fed mask or a combination of activated carbon filter and particular filter is required. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

PROC11: Non industrial spraying

Wear a one-way overall, gloves and a full-face respirator mask with external air supply.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterisation ratio (PEC/PNEC)
			Air	PEC	0 mg/m³	0
			Freshwater	PEC	0 mg/l	0
			Marine water	PEC	0 mg/l	0
			Sediment	PEC	0 mg/kg dry weight	0
			Soil	PEC	0 mg/kg dry weight	0
			STP (sewage-treatment plant)	PEC	0 mg/l	0
			Secondary poisoning	PEC	0 mg/kg wet weight	0
			Humans via the environment	PEC	0 mg/kg body weight/day	0

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
All PROCs			short term, inhalation	Not relevant	
All PROCs			short term, dermal	Not relevant	
PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 5	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 10	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 11	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 13	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 14	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
PROC 15	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	0.21 mg/m³	0.42
	Qualitative assessment		Workers (dermal)	*	

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

*Due to the applied RMMs it is considered that the risks of dermal exposure are sufficiently controlled.

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

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.